Appendix B

Vapor Vacuum Extraction Treatment
Operating Procedures, Log Sheets, and Round Sheets

VVET Thermal Oxidizer Startup, Operating, and Shutdown Procedure

TPR-1628

Technical Procedure Radioactive Waste Management Complex	**VVET UNIT STARTUP, OPERATIONS, AND SHUTDOWN**	Identifier: TPR-1628 Revision: 3 Page: 1 of 31
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This document has been completely rewritten resulting in no revision bars

STANDARD OPERATING PROCEDURE

VVET Unit Startup, Operations, and Shutdown

Facility/System: VVET Unit

REVIEWERS	Required (X)
RWMC Radiological Engineer	X
RWMC Rigging Engineer	
RWMC Industrial Safety Engineer	X
RWMC Quality Engineer	X
RWMC Industrial Hygienist	X
RWMC Environmental Engineer	
RWMC Fire Protection Engineer	X
RWMC Criticality Engineer	
RWMC System Engineer	
RWMC Operations	X
OSB	X

REVISION LOG

Rev.	Date	Affected Pages	Revision Description
0	09/09/99	All	Standard Operations Procedure needed for VVET Startup. See DAR: EO-RS-5001.
1	03/20/00	See revision bars throughout document	Clarify steps by changing sequence of procedure. See DAR: EO-RS-5379.
2	07/06/00	P. 8, 25, and 27	Adding references for Forms-231, -232, -233, -234, -236, -239, -240, -241, and –242. Add data to Table 2 and Section 5. See DAR: EO-RS-5739.
3	03/05/01	All	Complete rewrite. See DAR: EO-RS-6304.

CONTENTS

TABLES

1. INTRODUCTION

1.1 Purpose

The Vapor Vacuum Extraction with Treatment (VVET) thermal oxidation units are operated as part of environmental remediation actions for Operable Unit (OU) 7-08, Organic Contamination in the Vadose Zone (OCVZ), at the Radioactive Waste Management Complex (RWMC).

1.2 Scope and Applicability

This procedure directs the startup, routine operations, response to alarms, and shutdown of the VVET thermal oxidation units, which are designated Units A and B. Both non-emergency (Sections 4.8 and 4.9) and emergency (Section 4.10) situations are covered under shutdown.

This procedure does not address sampling activities. Extracted vapor is routinely sampled for volatile organic contaminants (VOCs) in accordance with TPR-1631, VVET Unit Operational Sampling. This procedure addresses operational activities to be performed by a qualified VVET Technician. See Appendix B for procedure basis.

2. PRECAUTIONS AND LIMITATIONS

2.1 Key VVET unit operating parameters with corresponding limiting and normal/design values are given in Table 1.

Table 1. Limiting and normal/design values.

Operating Parameter	Minimum	Maximum	Normal/ Design
Oxidizer operating temperature	1,400°F*	2,100°F	1,800°F
Propane Pressure			
Main Line (at pressure indicator PI-220B)	3.3 psig	N/A	6 psig
Line to preheat burner (at PI-221)	N/A	2.8 psig	N/A
Line to fume/air mixing point (at PI-222)	N/A	5.2 psig	4 psig
Total air/fume flow to oxidizer	340 SCFM	550 SCFM	413 SCFM

* except during oxidizer heat up.

2.2 Each oxidizer is equipped with a programmable logic controller (PLC) that has as one of its functions ensuring that the oxidizer stays within acceptable operating conditions. The PLC will automatically shut down the oxidizer if the oxidizer moves outside of the acceptable conditions. Table 4 provides the limits that

delineate the acceptable operating conditions and describes specific actions taken by the PLC in response to corresponding shutdown alarm activation.

2.3 Operating the VVET units outside of the normal, acceptable operating conditions may result in either poor efficiency with respect to destruction of organic contaminants in the fume or damage to the oxidizer unit and its components.

2.4 Only VVET technicians meeting the training and experience requirements set by the OCVZ Program, as detailed in the VVET Training Plan and Qualification Card, are authorized to undertake the actions, except for those where an electrician is directed to complete the activity described in this procedure. The only other exception to this requirement is for personnel involved in on-shift training and who are under the direct and immediate supervision of an authorized VVET technician.

2.5 Repairs, troubleshooting, and corrective actions that require craft work must be done per STD-101, Integrated Work Control Process. However, VVET Technicians are allowed to perform limited troubleshooting and corrective actions following approval from the System Engineer (SE) or designated alternate (for example, applying heat in cold weather to iced-up valves).

2.6 During tasks that intentionally release propane, a maximum of 1.5 lb of propane may be released without notifying the Spill Response Team.

NOTE: *During a single evolution (for example, taking a unit from down mode to run mode), the technician shall not vent propane more than 15 times without consulting with the SE.*

2.7 Maintain a minimum distance of 25-ft between any ignition source and the propane storage tanks.

NOTE: *Propane vaporizers (and associated pilot flames) require a 10-ft minimum separation from the propane storage tasks instead of 25-ft.*

2.8 A unit may not be left in preheat mode between noncontiguous shifts.

2.9 Sturdy above-the-ankle shoes, safety glasses with side shields, hard hats, and Health and Safety Plan (HASP) training are required for entry into the fenced area.

2.10 Enclosure doors must be secured from blowing shut on an operator during windy weather.

3. PREREQUISITES

3.1 IF a unit has undergone significant (as determined by the SE or Project Manager) repairs or modifications
THEN a VVET unit system operation test shall be performed to verify system operability before attempting normal operations.

The Qualification Test Procedure (QTP)-022, VVET Unit System Operation Test, should be followed. This procedure describes steps to be taken by a qualified VVET technician to perform operation tests (or checks) on both the main system functions and the alarm system.

3.2 The VVET technician must have a working cellular telephone or a radio while in the Subsurface Disposal Area (SDA).

3.3 Review the portions, if any, of the narrative log that cover information not yet reviewed by the person who is about to use this procedure.

3.4 IF performing Section 4.2.3,
THEN obtain insulating mat, flash-protecting boundary (FPB) materials, face shield, and Class 00 gloves.

3.5 IF performing Section 4.4,
THEN obtain leather gloves, long sleeves, and an electric match.

4. INSTRUCTIONS

4.1 General Instructions

NOTE 1: *Unit identifiers VVEA and VVEB are truncated for ease of use of this procedure. Equipment is called out using the component code and number only. For example, VVEA-FCV-210 will be called out as FCV-210 in this procedure.*

NOTE 2: *This procedure discusses the eight operational modes of the thermal oxidizers. The eight modes are described in Appendix A.*

4.1.1 Notify the RWMC Shift Supervisor (SS) and the VVET Operations Field Technician Lead (OFTL) of changes in a unit's status, abnormalities, difficulties encountered in performing assigned tasks, or other unexpected events.

4.1.2 Notify the Radiological Control Technician (RCT) Foreman after vapor extraction for a given VVET Unit is interrupted and before vapor extraction is resumed.

NOTE: *The RCT foreman may require that an air sampling filter paper sample be changed out prior to resuming vapor extraction.*

4.1.3 GO TO the appropriate section from Table 2 based on the system condition to be achieved:

NOTE: *The technician may proceed to either Section 4.6 or 4.7 as soon as a warning or shutdown alarm is observed.*

Table 2. System conditions.

Condition to be achieved	Action Needed	Procedure Section
Operational readiness	Perform pre-operational checks	4.2
Compressed air available for use	Place air compressor into operation	4.3
Propane ready for use	Place propane subsystem into use	4.4
Oxidizer operating	Place oxidizer into operation and/or perform normal system monitoring and logging.	4.5
Oxidizer operating with no warning alarms	Correct condition that caused warning alarms	4.6
Oxidizer operable	Resolve/eliminate condition that shut down oxidizer	4.7
Oxidizer shutdown (normal)	Perform normal oxidizer shutdown	4.8
Oxidizer shutdown (immediate)	Perform immediate oxidizer shutdown	4.9
Oxidizer shutdown (emergency)	Perform emergency oxidizer shutdown	4.10
Safe extended shutdown	Isolate and/or turn off subsystems	4.11
Status quo	None	Exit Procedure

4.2 Pre-Operational Checks

4.2.1 IF deemed necessary by the VVET Technician or System Engineer,

OR

IF directed by other work control documentation,
THEN obtain RWMC Form-254, Component Lineup Sheet, that directs which portions of the component lineup sheet must be completed.

4.2.2 IF RWMC Form-254 requires completion of a component lineup for the Electrical Power Supply – Part B lineup,
THEN complete Step 4.2.3.

4.2.3 Electrician: Perform Electrical Power Supply – Part B component lineup.

4.2.3.1 Verify that no portable generator is connected to DSW-GEN.

4.2.3.2 Ensure disconnect switches DSW-GEN and DSW-811 are in the open position.

WARNING

PP-811 contains exposed 480 V conductors that could present an electrocution hazard.

4.2.3.3 IF obstructions (for example, snow and ice) are present that would prevent use of an electrically rated insulating mat adjacent to PP-811,
THEN have the obstructions removed.

4.2.3.4 Place electrically rated insulating mat on the ground adjacent to PP-811.

4.2.3.5 Ensure backup electrician is present.

4.2.3.6 Open the cover of PP-811.

4.2.3.7 IF breaker switches MCP-B210, MCP-C910, and CB-LP1 are in the required positions per the component line up sheet,
THEN close and secure the cover and GO TO Step 4.2.3.14.

4.2.3.8 Close the PP-811 cover.

4.2.3.9 Establish a FPB at 36 in.

4.2.3.10 Don face shield and Class 00 gloves.

4.2.3.11 Open the cover of PP-811.

4.2.3.12 Place breaker switches in the required positions per the component lineup sheet.

4.2.3.13 Close and secure the cover.

4.2.3.14 Remove the mat and, if in place, the FPB.

4.2.3.15 Mark the "Position Correct" column and sign and date as positioner for "Electrical Power Supply – Part B."

NOTE: *If the Emergency Shutdown (ESD) push-button is pushed in, the control panel displays will be off.*

4.2.4 VVET Technician: IF the ESD push-button is in the pushed-in position, WHEN the VVET Technician has determined, and documented in the narrative log, that the condition that caused the push-button to be pushed in has been corrected,
THEN place the ESD push-button in the pulled-out position.

NOTE: *The control panel displays are restored when the ESD push-button is pulled out.*

4.2.5 IF the SYSTEM ON light is NOT energized at control panel CP-810, AND the electrical component line-up is correct,
THEN notify the OFTL or SE and exit this procedure.

4.2.6 IF all of the lights on the control panel face are NOT energized when the PANEL LIGHT CHECK button is pushed,
THEN notify the OFTL or SE and exit this procedure.

NOTE: *The lights are 120 volts and replacement is done by Maintenance.*

4.2.7 Verify that the uninterruptible power supply (UPS) power-on light (green light next to the "~" symbol) is on and no other UPS indicator lights are on.

4.2.8 IF conditions are not met in Step 4.2.7,
THEN the VVET Technician may proceed to Step 4.2.9 if directed by the SE or the OCVZ Electrical Engineer.

4.2.9 GO TO Step 4.1.3. (The pre-operational checks are complete.)

4.3 Compressed Air Subsystem

4.3.1 IF the compressed air system is in operation,
THEN GO TO Steps 4.3.12and 4.3.13 to ensure that the air regulators are in service,
AND return to Step 4.1.3.

4.3.2 Complete RWMC Form-254 for the compressed air subsystem.

4.3.3 Remove and examine the compressor COM-910 crankcase oil level bayonet gauge.

NOTE: *Discoloration or a higher oil level reading may indicate the presence of condensed liquids.*

4.3.3.1 IF the oil is contaminated,
THEN arrange for Maintenance to drain and replace the oil.

4.3.3.2 IF the oil level is less than the low mark on the gauge,
THEN have Maintenance add oil so that the level is between the low and high marks on the gauge.

4.3.4 Drain liquid, if any, from the air receiver using the draincock.

WARNING

Operation of the compressor without the guard in place is prohibited and could result in personnel injury.

4.3.5 Start the compressor by placing the MSTR-910 switch to the ON position.

NOTE: *The compressor motor will not start unless the air receiver pressure as indicated by PI-910A is less than about 80 psig.*

4.3.6 IF the compressor exhibits excessive vibration or noise, THEN stop the compressor by turning the MSTR-910 switch to the OFF position and notify the OFTL or SE.

4.3.7 IF the oil pressure indicated on PI-910E is not 18 to 20 psig, THEN adjust the pressure into that range.

4.3.7.1 Loosen the locknut on the oil pressure adjustment screw.

4.3.7.2 Turn the adjustment screw either clockwise to increase the oil pressure or counter-clockwise to decrease the pressure.

4.3.7.3 Tighten the locknut.

4.3.8 IF any of the conditions of Steps 4.3.9 through 4.3.11 CANNOT be verified, THEN notify the OFTL or SE and exit this procedure.

4.3.9 Verify that the compressor cycles off and on between about 120 psig and 80 psig.

4.3.10 After the air receiver pressure reaches 60 psig, verify that the air dryer DRY-110 cycles about every 5 minutes by ensuring that PI-910B and PI-910C alternately cycle between 0 psig and the air receiver pressure.

4.3.11 After the air receiver pressure reaches 100 psig, verify that differential pressure indicators PDI-920A, PDI-920B, and PDI-920C are in the green range.

NOTE: *Steps 4.4.12 and 4.4.13 may be completed sequentially for one regulator and then repeated for the next regulator.*

4.3.12 IF the instrument air regulators are set outside of the pressures specified below,
THEN adjust the regulators to the correct pressures.

Regulator	Set Pressure (psig)	Pressure Gauge
PCV-920 F	45 – 55	Built into regulator
PCV-920 H	30 – 40	Set per Step 4.3.12.1
PCV-910	55 – 65	PI-910D

4.3.12.1 With TIC-341H in MANUAL mode at a controller output of 90%, adjust PCV-341 so that about 14 psig is obtained on the FCV-341 positioner gauge, adjust the PCV-341 knob clockwise 180° (that is, ½ turn).

4.3.13 Clean the drip well of each regulator by opening the draincock and closing it once all particulate matter and moisture (if any) have been blown out of the drip well.

4.3.14 Return to Step 4.1.3. (The compressed air subsystem is ready for use.)

4.4 Propane Subsystem Startup

4.4.1 IF the vaporizer pilot flame is on,
THEN GO TO Step 4.4.16.

4.4.2 Complete RWMC Form-254 for the propane subsystem.

NOTE: *Regulator PCV-020A has been pre-set and should not be adjusted.*

4.4.3 Don leather gloves and long sleeves.

NOTE: *If HCV-020D is opened too quickly, the excess flow valve inside the tank may close.*

4.4.4 Fill the vaporizer with liquid propane by slowly opening liquid supply line valve HCV-020D.

4.4.5 IF the excess flow valve inside the tank closes,
THEN close HCV-020D, allow the excess flow valve to equalize, and reopen HCV-020D.

WARNING

If vaporizer pilot light is not lit correctly, then burns to personnel may result.

4.4.6 Turn the control dial on the vaporizer thermostat counter-clockwise to the pilot button setting.

4.4.7 Push and hold the button, and immediately proceed to Step 4.4.8.

4.4.8 Standing to the side of the vaporizer, light the pilot light with the electric match.

4.4.9 Continue to hold the button for 30 to 60 seconds and then release.

4.4.10 IF the pilot flame remains lit,
THEN GO TO Step 4.4.13.

4.4.11 IF pilot light goes off after releasing dial,
THEN turn the thermostat control dial to OFF.

WARNING

If the 5-minute wait period is not observed, then burns to personnel may result.

4.4.12 Wait 5 minutes, then repeat Steps 4.4.6 through 4.4.10.

4.4.13 Turn the vaporizer thermostat control dial counter-clockwise to 3 ¼ position on the dial during warm weather or to the 5 position during cold weather.

4.4.14 Allow the burners to heat the vaporizer until the main burner cycles off.

4.4.15 Open HCV-020E.

4.4.16 GO TO Step 4.4.13 to verify that the thermostat is at the correct setting, THEN return to Step 4.4.17.

4.4.17 IF the pressure indicated on PI-020C is less than 22 to 25 psig, THEN adjust PCV-020B as necessary to return the pressure to that range.

4.4.18 Open HCV-220.

NOTE: *If the pressure indicated by PI-020C is >25 psig, then the pressure will be adjusted later (during completion of Step 4.5.20).*

4.4.19 GO TO Step 4.1.3. (The propane subsystem is ready for use.)

4.5 VVET Unit Startup

4.5.1 IF the sum of the propane tank level gauge readings is NOT greater than 10%
THEN notify the OFTL or SE and exit this procedure.

4.5.2 Place TIC-341H, the oxidizer temperature control loop, in MANUAL mode and adjust the controller output to 20% to 30%.

4.5.3 Place FIC-210 in MANUAL mode and adjust the controller output to 48 to 52%.

4.5.4 IF necessary to vent propane in a dead-headed line, THEN vent propane according to the following:

Pressure Indicator	Vent Valve
PI-220B	PBV-220
PI-221	PBV-221

4.5.5 Set propane pressure indicated by PI-220B at 5 to 7 psig by adjusting PCV-220.

CAUTION

If the preheater is started when TIC-341H is >1,000°F and the oxidizer is cooling from either the profile or run mode, then equipment damage may occur.

WARNING

Operation of the blower without the guard in place is prohibited and could result in personnel injury.

4.5.6 Push the PREHEATER START button.

4.5.7 Go to the step indicated below based on the conditions given.

TIC-341H (°F)	Cooling Down from Mode	Step
N/A	Heating up from cold start	4.5.9
<1,000	All modes	4.5.9
>1,000	Preheat	4.5.9
>1,000	Profile or run	4.5.8

4.5.8 Complete Steps 4.5.9 A through E, but push the BLOWER STOP button at CP-810 BEFORE the start of the ignition cycle (see Step 4.5.14 if TIC-341H does not cool to <1,000°F prior to the end of the purge cycle.

4.5.9 IF items A through E occur as listed (to complete the preheater purge cycle),
THEN GO TO Step 4.5.14.

A. The FUME/AIR TO OXIDIZER VALVE indicator light is energized indicating valve FCV-210 is open, opening the air path from the blower to the oxidizer vessel

B. The COMBUSTION AIR TO BURNER light is energized indicating valve FCV-230 is open, opening the air path from the blower to preheater PH-330.

C. Valve FCV-911, opens, opening the instrument air path from the compressor to the preheater

D. Vacuum blower BLO-210 starts ~3 sec after the preheat start pushbutton is pushed, providing there are no alarm conditions

E. The PREHEATER PURGING indicator light is energized, beginning the 5 min air purge of the preheater and thermal oxidation vessel.

F. The purge cycle continues for a total of 5 min.

4.5.10 IF the BLOWER STOP button was pushed during completion of Step 4.5.9
THEN GO TO Step 4.5.6.

4.5.11 IF the problem preventing a successful move from one mode to the next mode CANNOT be resolved based on the instructions given in Steps 4.5.12 through 4.5.13, 4.5.15, 4.5.17, 4.5.18, 4.5.28, or 4.5.34:
THEN notify the OFTL or SE and exit this procedure.

4.5.12 IF a system alarm is indicated,
THEN correct the alarm condition per section 4.7, and GO TO Step 4.1.3.

4.5.13 IF either indicator light did not energize,
THEN determine which valve is not opening and resolve the problem,
AND GO TO Step 4.1.3.

NOTE: *FCV-210 and FCV-230 may be operated manually (for troubleshooting only) from the control panel by placing the respective switch to the OPEN position.*

4.5.14 IF items A through G occur as listed (to complete the ignition cycle),
THEN GO TO Step 4.5.16.

A. The COMBUSTION AIR TO BURNER indicator light remains energized (FCV-230) stays open, keeping air flowing to the preheater

B. The FUME/AIR TO OXIDIZER VALVE indicator light is de-energized (FCV-210 closes, closing the air path from the blower to the oxidizer)

C. FCV-211, the blower vent valve, opens

D. FCV-223, the preheater pilot valve, opens providing propane flow to the pilot light

E. FCV-911 closes, shutting off purge air to the pre-heater

F. The PREHEATER PURGING indicator light is de-energized.

G. Igniter BX-330 energizes.

NOTE: *If no flame is detected within 10 sec, the blower will shut down and the PLC-operated valves will close. The BALL-330 no flame relay alarm light energizes.*

4.5.15 IF a system alarm is indicated,
THEN correct the alarm condition per Section 4.7, and GO TO Step 4.1.3.

4.5.16 IF items A through C occur as listed (to move the unit into preheat mode),
THEN GO TO Step 4.5.18.

A. FCV-221, the main burner block valve, opens providing propane to the preheater's main block

B. FCV-223, the preheater pilot light valve, closes after 10 sec, stopping propane flow to the pilot light

C. The BURNER ON indicator light energizes.

NOTE: *Upon entering the preheat mode, promptly increasing the propane flow by increasing the TIC-341H control loop output (in MANUAL mode) may be necessary to maintain a preheater flame.*

4.5.17 IF a system alarm is indicated,
THEN correct the alarm condition per Section 4.7, and GO TO Step 4.1.3.

CAUTION

Damage to the oxidizer may occur if the heat up process is performed incorrectly.

4.5.18 IF the unit shuts down at anytime during the preheat mode, THEN correct the alarm condition per Section 4.7, and GO TO Step 4.1.3 after resolving the problem.

4.5.19 Manually adjust the TIC-341H controller to 45 to 60%.

4.5.20 IF vaporizer outlet regulated pressure as indicated by PI-020C is not 22 to 25 psig, THEN adjust PCV-020B to achieve the desired pressure.

4.5.21 IF the pressure indicated by PI-020C does NOT remain between 22 to 25 psig during completion of Section 4.5, THEN repeat Step 4.5.20, AND return to the Section 4.5 step in progress at the time Step 4.5.20 was repeated.

4.5.22 IF the pressure indicated by PI-220B does NOT remain between 5 to 7 psig during completion of Section 4.5, THEN repeat Step 4.5.5, AND return to the Section 4.5 step in progress at the time Step 4.5.5 was repeated.

4.5.23 Wait at least one hour after Step 4.5.19 is completed.

4.5.24 Manually increase the TIC-341H control loop output incrementally, without exceeding a 10% change during a rolling 30-minute period, until the minimum bed thermocouple temperature as indicated by TIC-341H is between 1,500 and 1,800°F.

NOTE: *Depending on ambient conditions, completion of Step 4.5.24 may require approximately 3 to 5 hours to complete.*

4.5.25 Wait until the bed temperature has about leveled out.

NOTE: *Depending on several parameters, completion of Step 4.5.25 may require approximately 1 to 3 hours.*

4.5.26 WHEN all of the oxidizer bed temperatures are at least 1,450°F, THEN push the PREHEATER STOP button to move the system to the profile mode.

NOTE: *If all of the oxidizer bed temperatures are not at least 1,450°F when the PREHEATER STOP button is pressed, the TEMP LOW/HIGH indicator light is energized. This will not shut the unit down but will indicate that the oxidizer bed temperatures are not appropriate and that the system will not roll into the profile mode until the temperatures have been achieved. With the PREHEATER STOP pressed, however, the system will automatically role into the profile mode once the temperatures have been reached.*

4.5.27 IF items A through J occur as listed (to move the unit into profile mode), THEN GO TO Step 4.5.29.

A. FCV-221 closes, stopping propane flow to the main burner block
B. The BURNER ON indicator light de-energizes
C. FCV-230 in the combustion air to burner line closes
D. The COMBUSTION AIR TO BURNER indicator light de-energizes
E. FCV-210 in the fume/air to oxidizer line opens
F. The FUME/AIR TO OXIDIZER VALVE indicator light energizes
G. FCV-222 opens providing propane to the fume/air to oxidizer line
H. The PROPANE TO FUME LINE VALVE indicator light energizes
I. FCV-211 the air bleed valve closes
J. The PROFILE indicator light energizes.

4.5.28 IF a system alarm is indicated, THEN correct the alarm condition per Section 4.7 and GO TO Step 4.1.3.

4.5.29 Place the FIC-210 controller in AUTOMATIC mode and adjust the setpoint to the value specified by the SE or designee and documented on the applicable VVET narrative log.

4.5.30 Place the TIC-341H controller in the AUTOMATIC mode and adjust the set point to a value between 1,800°F and 1,850°F.

NOTE 1: *Technician judgment is used in setting the specific temperature (within the 1,800°F to 1,850°F range) in order to ensure a desired minimum temperature will be maintained at all of the temperature elements.*

NOTE 2: *At the VVET technician's discretion and if the unit is to be constantly manned during the transition from the profile to run mode, the FIC-210 and TIC-341H controllers may be operated manually until after the run mode is achieved. Both controllers would then be placed in the AUTOMATIC mode and be adjusted to the set points identified.*

NOTE 3: *When all of the oxidizer bed temperatures are 1,600°F or higher, the READY indicator light is energized, indicating the unit is ready to move to the run mode.*

4.5.31 Set PIC-100 in MANUAL mode and adjust the controller output to 100%.

4.5.32 WHEN the READY indicator light is energized,
THEN place the FUME TO BLOWER VALVE switch to the OPEN position (open FCV-100) to enter the run mode.

NOTE: *If all oxidizer bed temperatures are not at least 1,600°F when the attempt is made to open the FCV-100 valve, the TEMP LOW/HIGH alarm light will be energized, the valve will not open, and the unit will not move into the run mode. This will not shut the unit down, but will indicate that the oxidizer bed temperatures are not appropriate.*

4.5.33 IF Items A and B occur as listed (to move the unit into run mode),
THEN GO TO Step 4.5.35.

A. FCV-100 opens incorporating extraction well fumes into the air flow going to the oxidizer;

B. The PROFILE and READY indicator lights de-energize and the PROCESSING indicator light energizes.

4.5.34 IF a system alarm is indicated,
THEN correct the alarm condition per Section 4.7 and GO TO Step 4.1.3.

NOTE: *No changes should be made to the oxidizer operational mode based only on the results of Steps 4.5.35 and 4.5.36.*

4.5.35 IF well air flow gauge FG-100A is reading <200 cfm, THEN notify the OFTL or SE.

4.5.36 IF well air pressure gauge is NOT reading between 3.5 and 10 in. Hg vacuum, THEN notify the OFTL or SE.

4.5.37 Monitor temperatures, flows and pressures as necessary. The control system will be in the automatic mode of operating and controlling air flow and propane for stable operation.

4.6 Warning Alarm Response

NOTE: *Warning alarms may occur during normal operation and are intended to signal to the technician a need to inspect the operating system for conditions approaching the bounds of an operating limit. Warning alarms are accompanied by an energizing of the unit's Amber Strobe Light. Warning alarms do not result in a curtailment of the unit's operation, but if the alarm conditions are not corrected, they may result in the activation of a shutdown alarm and the corresponding automatic shutdown of the system.*

4.6.1 IF a warning alarm (and the associated Amber Strobe Light) is activated, THEN verify which alarm indicator is activated on the control panel, and troubleshoot to determine the cause of the alarm using the information in the following table (Table 3).

Table 3. Warning alarms.

Alarm[1]/Panel Indicator	Setpoint/Condition	System Response	Corrective Action
None/Panel Lights Bulb Check	Pressed/activated	Panel lights will activate when the bulb check button is pressed	Any panel lights not activated should be replaced. If this does not resolve the problem, electrical connections and wiring need to be checked.
Amber Beacon/ PT-100 readout High pressure in fume line warning	-50 IWC[2]	Run Mode Only: Amber beacon will be energized until the pressure drops to –55 IWC or lower.	The primary components involved are the wells, blower, and fume line. Potential causes include line filter plugging, upset in upstream processes, or blower problem. Determine high pressure source and correct.

Table 3. (continued).

Alarm[1]/Panel Indicator	Setpoint/Condition	System Response	Corrective Action
Amber Beacon/ PT-100 readout Low pressure in fume line warning	-140 IWC	Run Mode Only: Amber beacon will be energized until the pressure raises to –135 IWC or higher.	The primary components involved are the wells, blower, and fume line. Potential causes include upset in upstream processes, or blower problem. Determine low pressure source and correct.
Amber Beacon/ FT-210 readout High total flow	550 SCFM	Profile, Run, and Post-Purge Modes: Amber beacon will be energized until the alarm is reset by the flow dropping to 545 SCFM	The primary components involved are the blower, oxidizer, and total flow line. Potential causes include blower problem and upset in upstream process or oxidizer. Determine high flow source and correct.
Amber Beacon/ FT-210 readout Low total flow	290 SCFM	Profile, Run, and Post-Purge Modes: Amber beacon will be energized until either the alarm is reset, or the Shutdown Alarm is trigger by the flow dropping to 250 SCFM.	The primary components involved are the blower, oxidizer, and total flow line. Potential causes include blower problem and upset in upstream process or oxidizer. Determine low flow source and correct.
Amber Beacon/ TE readouts high temperature warning	380°F on TE-340 (inlet) 650°F on TE-341N (dollar plate) 2000°F on TE-341A, B, C, D, E, F, G, H, J, or K (within matrix) 1380°F on TE-342 (outlet)	All Modes: Amber beacon will be energized until either the alarm is reset or the Shutdown Alarm is triggered by the temperature increasing to the corresponding Shutdown Alarm set point. The alarm is reset if the temperature at the alarming element drops below the set point and the temperature at TE-341H is less than 1990°F.	The primary elements involved are the oxidizer, its inlet and outlet, fume/air flow (i.e., the blower), and propane feed. Potential causes include blower and propane feed problems and upset in upstream process or oxidizer. Determine high temperature source and correct.
Amber Beacon/ TE readouts Oxidizer vessel low temperature warning	1450°F on TE-341A, B, C, D, E, F, G, H, J, or K (within matrix)	All Modes: Amber beacon will be energized until either the alarm is reset or the Shutdown Alarm is triggered by the temperature of any element decreasing to1400°F. The alarm is reset when the temperature at TE-341H is at least 1460°F and all other elements are above the set point	The primary elements involved are the oxidizer, its inlet and outlet, fume/air flow (for example, the blower), and propane feed. Potential causes include blower and propane feed problems and upset in upstream process or oxidizer. Determine low temperature source and correct

1. The "Alarm" designation, in this case, refers to the alarm that can be seen as opposed to the "Panel Indicator" which refers to the panel readouts that will have to be reviewed to determine the cause of the alarm.
2. Inches water column

4.6.2 Take action to understand and, as appropriate, correct the condition causing the warning alarm. If it is necessary to shut down the unit, use the normal shutdown procedure (Section 4.8).

4.6.3 IF the warning alarm has been eliminated,
THEN return to the procedure step that was in progress when the alarm occurred.

4.7 Shutdown Alarm Response

NOTE: *Shutdown alarms are activated when limits of acceptable operation are reached during VVET unit operations and a continuation of the trend may result in either (1) potential personnel danger, or (2) equipment mechanical damage. Shutdown alarms are accompanied by an energizing of the unit's red strobe light and a shutdown of the unit to its prepare mode. Depending on the nature of the alarm, the unit may or may not go through a 2-min postpurge mode.*

4.7.1 IF a shutdown alarm (and the associated Red Strobe Light) is activated,
THEN verify which alarm indicator is activated on the control panel and/or the alarm designation on the Cimplicity® HMI screen, and troubleshoot and determine the cause of the alarm using the information in Table 4.

4.7.2 IF the system is shut down due to an alarm and the alarm panel lights are not energized,
THEN verify there is not a bad bulb by pushing the PANEL LIGHT CHECK button.

Table 4. Shutdown Alarms.

Alarm[1]/Panel Indicator	Setpoint/Condition	System Response	Corrective Action
ALM-220 / PALL-220 Low propane pressure alarm	3.3 psig	Run Mode: Closes FCV-100 and FCV-222, if pressure is at or below setpoint for 5 seconds, then does 2 minute post-purge prior to shutdown of blower and other valves (return to Prepare Mode). All Other Modes: Shutdown of blower and valves (return to Prepare Mode) if pressure is at or below set point for 5 seconds	Check propane pressure coming from main propane tank. Pressure should be above 3.3 psig.

Table 4. (continued).

Alarm[1]/Panel Indicator	Setpoint/Condition	System Response	Corrective Action
ALM-221 / PAHH-221 High propane pressure at preheat burner alarm	2.8 psig	Run Mode: Closes FCV-100 and FCV-222 if set point is reached, then does 2 minute post-purge prior to shutdown of blower and valves. (return to Prepare Mode). All Other Modes: Shutdown of blower and valves (return to Prepare Mode) if set point is reached.	Check propane pressure of line going to preheat burner. Pressure should be below 2.8 psig.
ALM-222 / PAHH-222 High propane pressure, propane to fume line alarm	5.2 psig	Run Mode: Closes FCV-100 and FCV-222, if set point is reached, then does 2 minute post-purge prior to shutdown of blower and valves. (return to Prepare Mode). All Other Modes: Shutdown of blower and valves (return to Prepare Mode) if set point is reached.	Check the propane pressure of line going to fume line. Pressure should be below 5.2 psig.
ALM-230 / PAL-230 Low combustion air pressure	0.72 psig	Ignition Start, Ignition, Preheat Start and Preheat Modes Only: Shutdown of blower and valves (return to Prepare Mode) if pressure is at or below set point for 5 seconds.	Check pressure of combustion air to burner. Pressure should be above 0.72 psig.
ALM-911 / PAL-911 Low instrument air pressure	60 psig	All Modes: Shutdown of blower and valves (return to Prepare Mode) is set point is reached. **NOTE:** *Alarm cannot be activated during Down or Prepare Modes.*	Check the air compressor that provides the compressed air to the line.
ALMFSLL / FAL-210 Low air flow to oxidizer timer alarm	250 SCFM	Profile, Run, and Post-Purge Modes: Shutdown of blower and valves (return to Prepare Mode) if air flow rate drops below set point and does not return to at least 5 SCFM above the set point within 10 seconds. Transition to Profile Mode (from Preheat): Shutdown of blower and valves (return to Prepare Mode) if air flow rate does not return to at least 5 SCFM above the set point within 2 minutes.	Problems related to the flow rate can be due to the blower, valves, oxidizer tank, or the flow transmitter.
ALM-RUN/ None	Setting of ALM-220, ALM-221, ALM-222, TEMPHI, TEMPLO, or closing of FCV-100	Run Mode (only): Closes FCV-100 and FCV-222, then does 2 min postpurge prior to shutdown of blower and valves.	Correct the alarm that caused the shutdown.

Table 4. (continued).

Alarm[1]/Panel Indicator	Setpoint/Condition	System Response	Corrective Action
ALMZ100 / None Fume line valve FCV-100 position alarm	Valve not positioned correctly alarm	Preheat Purge Mode: Shutdown of blower and valves (return to Prepare Mode) if FCV-100 is not closed. Run Mode: Shutdown of blower and valves (return to Prepare Mode) if FCV-100 is not open.	Ensure that valve FCV-100 is opening and closing appropriately. Verify that the FCV-100 close limit switch is energized when the FCV-100 valve is closed.
ALMZ210 / None Fume/air line valve FCV-210 position alarm	Valve not open alarm	All Modes (where FCV-210 is to be opened): Shutdown of blower and valves if FCV-210 does not open within 3 sec of command.	Ensure valve FCV-210 opens when solenoid is energized. If opening, verify the fume/air oxidizer open limit switch is on when FCV-210 is open.
ALMZ221 / None Propane line valve FCV-221 position alarm	Valve not closed alarm	Preheat Purge Mode (only): Shutdown of blower and valves (return to Prepare Mode) if FCV-221 is not closed.	Ensure why the FCV-221 valve is open or if the limit switch is not functioning appropriately.
ALMZ222 / None Propane line valve FCV-222 position alarm	Valve not closed alarm	Preheat Purge Mode (only): Shutdown of blower and valves (return to Prepare Mode) if FCV-222 is not closed.	Ensure that valve FCV-222 is closed.
ALMZ230 / None Air line valve FCV-230 position alarm	Valve not open alarm	Preheat Purge & Ignition Start Modes (only): Shutdown of blower and valves (return to Prepare Mode) if FCV-230 does not open within 3 sec of command.	Ensure that valve FCV-230 is opening when the solenoid is energized. If the valve is opening, ensure that the fume/air oxidizer open limit switch is on when the FCV-230 valve is open.
ALMZ341 / ZAH-341 Propane line valve FCV-341 position alarm	Valve open greater than 38% alarm	Preheat Purge Mode (only): Shutdown of blower and valves (return to Prepare Mode) if FCV-341 is open > ~38%.	Check the percentage open of the FCV-341 valve (should be in the range of 20% to 30% open).
BLOCKED / None Fume/air line valves FCV-210 and FCV-230 position alarm.	Valves not open alarm	All Modes: Shutdown of blower and valves (return to Prepare Mode) in 1 second if FCV-210 and FCV-230 are never closed at the same time while the blower is running.	Ensure valves FCV-210 and FCV-230 are opening when the solenoid is energized. If the valves are opening, verifying the fume/air oxidizer open limit switch is on when the FCV-210 valve is open. Ensure the combustion air to burner valve open limit switch is on when the FCV-230 valve is open.

Table 4. (continued).

Alarm[1]/Panel Indicator	Setpoint/Condition	System Response	Corrective Action
NO-FLAM / NO FLAM No flame detected in preheater alarm.	UV detector does not detect flame	Ignition Mode: Shutdown of blower and valves (return to Prepare Mode) if no flame detected within 10 sec of energizing igniting transformer. Preheat Mode: Shutdown of blower and valves (return to Prepare Mode) if no flame detected when the burner is ON.	Clean the burner, UV detector, and igniting plug. Verify that propane is going through the FCV-223 valve to the pilot.
TEMPHI / Temp Hi/Lo Oxidizer vessel high temp alarm.	400°F on TE-340 (inlet) 700°F on TE-341N (dollar plate) 2100°F on TE-341A, B, C, D, E, F, G, H, J, or K (within matrix) 1400°F on TE-342 (outlet)	Run Mode: Closed FCV-100 and FCV-222 if set point is reached at any temperature element, then does 2 minute post-purge prior to shutdown of blower and other valves (return to Prepare Mode). All Modes: Shutdown of blower and valves (return to Prepare Mode) if set point is reached at any temperature element.	With respect to within matrix elements, observe readouts for all of the oxidizer tank temperatures. If all are substantially different from the alarming temperature, there is a possibility of a bad temperature element. When a temperature element opens (no continuity), the display will read close to the high end of the temperature range (2500°F). If a temperature element is shorted, it will read approximately 0°F. With respect to inlet, dollar plate and outlet elements, elevated temperatures could indicate the oxidizer's reaction zone has moved from the zone of the inside elements and that the propane or fume/air flow may have been inappropriate.
TEMPLO/Temp Hi/Lo Oxidizer vessel low temp. alarm.	1400°F on TE-341A, B, C, D, E, F, G, H, J, or K (within matrix)	Profile and Run Modes Only Run Mode: Closes FCV-100 and FCV-222 if set point is reached at any temperature element, then does 2 minute post-purge prior to shutdown of blower and other valves (return to Prepare Mode) Profile Mode: Shutdown of blower and valves (return to Prepare Mode) if set point is reached at any temperature element	Observe readouts for all of the oxidizer tank temperatures. If all are substantially different from the alarming temperature there is a possibility of a bad temperature element. When a temperature element opens (no continuity), the display will read close to the high end of the temperature range (2500°F). If a temperature element is shorted, it will read ~0°F.

1. The "Alarm" designation, in this case, refers to the alarm that can be seen on the Cimplicity® HMI Screen as opposed to the "Panel Indicator" which refers to the alarm light energized on the control panel.

4.7.3 IF the system is shut down due to an alarm and the alarm lights are not on and have been verified to have good bulbs,
THEN verify the position of the valves because the unit has shut down due to a valve not being in the correct position.

NOTE: *The valves FCV-210 and FCV-230 can be manually opened by pushing the system alarm reset button and at the same time turning the switch of the valve to OPEN. The valve will close if the valve open/close switch is released or if the system alarm reset push button is released. Correct operation of the valve may be ensured by observing the valve opening and closing without sticking.*

4.7.4 WHEN the cause of the shutdown is determined, understood, and, as appropriate, corrected,
THEN restart the unit in accordance with the startup procedure (GO TO Step 4.1.3).

4.8 Normal Shutdown

4.8.1 Press the SYSTEM ALARM RESET push button.

4.8.2 Wait until the PLC shuts down the unit by performing the following actions:

A. Close valve FCV-100, cutting off the flow of extraction well fumes;

B. Close valve FCV-222, stopping flow of propane to the oxidizer;

C. Turn the PROCESSING light OFF;

D. Allow the blower to run in the postpurge state for 2 min;

E. Shut down the blower and close the PLC-controlled valves

4.8.3 Return to Step 4.1.3.

4.9 Immediate Shutdown

NOTE: *Under this shutdown scenario, the system is placed in the prepare mode without a post purge.*

4.9.1 Press the BLOWER STOP button at CP-810.

4.9.2 IF the unit is not automatically shut down per Steps 4.9.2.1 and 4.9.2.2, THEN notify the OFTL or SE.

4.9.2.1 The blower shuts down and all of the PLC-operated valves close.

4.9.2.2 The PROCESSING indicator light de-energizes.

4.9.3 Return to Step 4.1.3.

4.10 Emergency Shutdown

NOTE: *Under this shutdown scenario, the system is placed in the down mode without a post purge and, unlike the immediate shutdown, all power to the PLC is cut off.*

4.10.1 Push the ESD push-button, located on the control panel.

WARNING

Do not perform Step 4.10.2 if an evacuation is required.

4.10.2 IF the unit is not automatically shut down per Steps 4.10.2.1 and 4.10.2.2,
THEN notify the OFTL or SE.

4.10.2.1 The blower shuts down and all of the PLC-operated valves close.

4.10.2.2 Power is cut off from the PLC and all panel indicators de-energize.

4.10.3 After the emergency is over, return to Step 4.1.3.

4.11 Post-shutdown Tasks

4.11.1 Close propane valve HCV-220 to isolate the propane subsystem from the oxidizer.

4.11.2 IF directed by the OFTL or the SE to shutdown the propane vaporizer, THEN set the thermostat to OFF.

4.11.3 IF directed by the OFTL or the SE,
THEN turn off compressor COM-910 by placing MSTR-910 in the OFF position.

4.11.4 Go to Step 4.1.3.

5. RECORDS

Record Description	Classification	Uniform File Code	Disposition Authority	Retention Period
TPR-1628 Case File	Permanent Quality	0276	A16-1.1	Cutoff at the end of each fiscal year. Offer to NARA after 25 years.
Form 434.14, Pre-job Briefing Checklist	Nonpermanent Quality	7301	TBD	Contact RWMC Records Management for additional information.
Form 434.15, Pre-job Briefing Attendance Record	Nonpermanent Quality	7301	TBD	Contact RWMC Records Management for additional information.
Form 433.24, Post-job Review Checklist	Nonpermanent Quality	7301	TBD	Contact RWMC Records Management for additional information.
VVET Logs*	Nonpermanent Quality EPI	7305	ENV1-e-6	Destroy when 75 years old.
RWMC Form-254, Component Lineup Sheet	Nonpermanent Quality	7301	TBD	Contact RWMC Records Management for additional information.

*VVET operations include the maintenance of a separate set of logs for each operating unit. Each set includes two log sheets to be completed daily, described as follows:

- Operating Log -- serves as a record for the operator's periodic observation and entry of instrument readouts and equipment operating parameters during their shift inspections.
- Narrative Sheet -- used to generate a history of conditions, events, problems, accomplishments, etc. for each unit.

6. REFERENCES

Companywide Manual 9, Conduct of Operations

Final Remedial Design/Remedial Action Workplan, Organic Contamination in the Vadose Zone, Operable Unit 7-08 (by Scientech Inc., SCI-COM-200-95, Oct. 1995)

INEL-96/0119, Health and Safety Plan for the Vapor Vacuum Extraction with Treatment for the Organic Contamination in the Vadose Zone at the Radioactive Waste Management Complex, Operable Unit 7-08

MCP-2973, Operations Organization and Administration

MCP-2974, Shift Routines and Operating Practices

MCP-2975, Control Area Activities

MCP-2980, Logkeeping

MCP-3450, Developing and Using Job Safety Analyses

MCP-3562, Hazard Identification, Analysis, and Control of Operational Activities

Piping and Instrumentation Drawings 511984 Sht 1 and 2, 511985 Sht 1 and 2, 511986 Sht 1 and 2, 511987, 511988, and 511989.

TPR-1631, VVET Unit Operational Sampling

STD-101, Integrated Work Control Process

7. APPENDICES

Appendix A, Procedure Basis

Appendix B, Thermal Oxidizer Operational Modes

APPENDIX A

Thermal Oxidizer Operational Modes

The eight operational modes of the VVET thermal oxidation units are as follows:

Mode	Description
Down	The system enters the down mode whenever the Emergency Shutdown (ESD) button is pushed in. Power to the control panel and system is cut off.
Prepare	This mode is used to evaluate switch positions and alarms before starting the unit. The ESD button must be pulled out.
Preheat purge	The oxidizer and preheater are purged with make-up air for 5 min to ensure no buildup of explosive vapors.
Ignition	Propane is supplied to the preheater pilot light and it is ignited.
Preheat	Combustion/makeup air and propane are supplied to the preheater. The pilot light goes off after 10 sec. The mode is maintained until all of the oxidizer chamber temperature elements reach 1,450°F.
Profile	Combustion air and propane feed changes (or switches) from the preheater to the main oxidizer vessel. The mode is maintained until all of the oxidizer chamber temperature elements reach 1,600°F.
Run	Fume feed (from the extraction wells) is introduced into the air and propane mix fed to the oxidizer.
Post purge	For normal shutdown, fume and propane feed are stopped and makeup air continues as a purge of the system for 2 min. The unit then shuts down to the prepare mode unless the ESD button is pushed in, which results in the down mode.

APPENDIX B

Procedure Basis

Step	Basis	Reference
General	Work processes shall be accomplished using approved procedures, drawings, instructions, work packages or other appropriate means commensurate with the complexity and importance of the work.	PRD-101 7.2.1.2
Step 2.6	Release reporting	Air Permitting Applicability Determination Addendum 01-01
Step 2.7	Propane tank location requirements	National Fire Protection Association Code # 58
Steps 4.1, 4.2, 4.5 through 4.10, Appendix B	Operation of thermal oxidizers	Operations and Maintenance Plan, Flameless Thermal Oxidation System for Treatment of Chlorinated Emissions.
Step 4.2.3	Electrical verification work	JSA RWMC-016
Step 4.3	Compressor operations	Quincy Compressor Instruction Manual, P/N #52201-104
Step 4.3.7, 4.3.8	Air dryer operations	Van Air Installation, Operations, and Maintenance Instructions, P/N 32-0171
Step 4.4	Work with propane subsystem	JSA RWMC-6588, Algas-SDI Operations and Maintenance – Direct Fired Models manual P/N 5001-108.
All	Safe work	JSA RWMC-425

VVET Thermal Oxidizer Operational

Sampling Procedure

TPR-1631

Technical Procedure Radioactive Waste Management Complex	VVET UNIT OPERATIONAL SAMPLING	Identifier: TPR-1631 Revision: 1 Page: 1 of 8
Document Control Center: (208) 526-2728	Document Owner: T. D. Cline Document Approver: NFM	Effective Date: 03/05/01
Manual: RWMC Technical Procedure Manual	USE TYPE 2	Change Number: EO-RS-6299 JSA Number: RWMC-425

STANDARD OPERATING PROCEDURE

VVET Unit Operational Sampling

Facility/System: VVET Unit

REVIEWERS	Required (X)
RWMC Radiological Engineer	X
RWMC Rigging Engineer	
RWMC Industrial Safety Engineer	X
RWMC Quality Engineer	X
RWMC Industrial Hygienist	
RWMC Environmental Engineer	
RWMC Fire Protection Engineer	
RWMC Criticality Engineer	
RWMC System Engineer	X
RWMC Operations	X
OSB	X
RWMC WCO	
Other	

REVISION LOG

Rev.	Date	Affected Pages	Revision Description
0	09/09/99	Entire Document	Standard Operations Procedure required for VVET startup. See DAR: EO-RS-5003.
1	03/05/01	See revision bars throughout document	Update procedure to meet new VVET requirements. See DAR: EO-RS-6299.

CONTENTS

1. INTRODUCTION

1.1 Purpose

This procedure outlines steps required to collect routine operational samples of the influent fume/air mix going to the thermal oxidizer vessel of each of the Vapor Vacuum Extraction Treatment (VVET) units. The VVET units are part of remedial actions for Operable Unit (OU) 7-08, Organic Contamination in the Vadose Zone (OCVZ), at the Radioactive Waste Management Complex (RWMC).

1.2 Scope and Applicability

This procedure covers guidelines for the daily (that is, per work shift) collection of samples of the influent fume/air mixture going to the VVET units located at RWMC. It covers VVET technician actions for the following:

- Collection of air/fume samples
- Transportation of the samples to the Central Facilities Area (CFA) laboratory
- Notation of the sampling actions in the VVET unit narrative log.

The sampling described in this document is in support of routine operations rather than the investigation and characterization efforts normally associated with Environmental Restoration (ER) projects. For this reason, the work is documented in the form of a technical procedure (TPR) rather than a sampling and analysis plan (SAP). However, because a SAP is the more traditional approach within the ER Program, this section of the procedure will be used to briefly address the elements commonly found in such a plan. The following discussion describes intended use of the data and measures taken to ensure that the data generated are suitable for their intended use.

Objectives and Data Use. The objective of this sampling effort is to obtain a representative sample of the influent streams of each of the VVET units. These air/fume samples are then to be analyzed for OCVZ contaminants of concern for the vapor transport mode. The data quality objectives (DQOs) for the air/fume sampling are to determine the amount of contaminants being processed through the VVET units and how contaminant concentrations change over time. The data will be used to (1) generate estimates of the total mass of contaminants treated, (2) generate estimates of contaminant emissions based on the estimated or calculated destruction efficiency of the VVET units, and (3) track trends in contaminant concentrations over time.

Sampling Location and Frequency. Samples are collected daily from each operating VVET unit. The sample port is located on the discharge side of the vacuum blower (B-210). Sampling tables have not been prepared and are not used for this routine and limited sampling effort.

Sample Identification. The technician will mark the sample container with a unique sample identification number. Sample numbers for this routine, daily sampling will not be assigned by the Sample Management Office (SMO).

Sampling Equipment and Procedures. Sampling equipment is limited to sample gas sampling bags and the VVET technician's narrative logbook to record the sampling event. The technician's personal protective equipment (PPE) is standard operating clothing including, specifically for the sampling event, leather gloves and safety glasses with side shields. Sample collection procedures are documented in this procedure.

Sample Handling, Packaging, and Shipping. The VVET technician is responsible for delivery of the filled sample containers to the analytical laboratory located at the CFA. No special handling, packaging, or shipping requirements are necessary.

Documentation. Documentation is limited to the sample identification assigned to each sample container; the VVET technician's bound narrative log sheets, noting the time and date of sample collection; and the laboratory's record of sample receipt. The combination of these records, for any sample, provide verification that custody was never relinquished and eliminates the need for a separate chain-of-custody form.

Handling and Disposition of Sampling Waste. The only wastes generated from this effort are the sample bags used to contain the air/fume sample that are no longer usable. These bags have been characterized as cold waste.

2. PRECAUTIONS AND LIMITATIONS

The air/fume mixture sampled under this procedure contains hazardous contaminants. Although concentrations are very small, the individual performing the sampling should minimize his, or her, own exposure to the fumes as well as anyone else in the area.

3. PREREQUISITES

3.1 Air/fume samples are to be collected on daily shift basis, but only from VVET Units that are in full operation (that is, in RUN mode).

3.2 Samples will be collected by qualified VVET technicians, or by individuals directly under the supervision of a qualified VVET technician.

3.3 Obtain empty sample bags from the laboratory and store them in a secured location inside the VVET unit.

3.4 Notify the Radiological Control Technician (RCT) Foreman when the system is opened and physical changes are made to vapor extraction wells or to the vapor vacuum extraction equipment.

4. INSTRUCTIONS

4.1 Visually inspect the sample bag to ensure that the bag has been evacuated and the valve is closed. Ensure that the bag is intact and there is no visible contamination on or in the bag.

4.2 Mark sampling date and time on the sample bag.

4.3 Open the sampling port to purge the fittings and connected plastic sample tube.

4.4 WHEN the port and tube have been vented for about 5 sec,
THEN connect labeled (or otherwise marked or designated) sample bag to the sample tube.

4.5 Open the sample bag's valve.

4.6 Fill sample bag to approximately ¾ volume by opening the sample port.

4.7 Close the sampling port.

4.8 Close valve on sample bag and remove bag from sample tube.

4.9 Record sample time and date in the narrative log for the specific VVET unit.

4.10 Place the sample bag in a secured location inside the VVET Unit.

4.11 Repeat Steps 4.1 through 4.10 for each VVET unit to be sampled during the shift.

4.12 Take samples to WMF-601 for a radiological survey before they are transported to the laboratory for analysis.

4.13 Transport the sample(s) from RWMC to the CFA laboratory for analysis.

NOTE 1: *From the time of sample collection until the samples are received by the laboratory, the VVET technician must maintain custody of all samples. Any time the samples are not in view or possession of the technician they must be in a secure location to prevent the possibility of tampering.*

NOTE 2: *Per DOE/ID-10587, Environmental Restoration Quality Assurance Project Plan, gas samples collected for analysis of organic constituents have a maximum holding time of 28 days (that is, they must be analyzed within 28 days of collection) and they can be preserved at ambient temperature until they are analyzed (that is, they do not require refrigeration).*

4.14 Verify that the samples are logged in at the laboratory and that they are either in the custody of a responsible individual at the laboratory or are in secure (locked) storage.

4.15 Record time of log-in at the laboratory in the narrative log for each VVET unit sampled.

5. RECORDS

Record Description	Classification	Uniform File Code	Disposition Authority	Retention Period
TPR-1631 Case File	Permanent Quality	0276	A16-1.1	Cutoff at the end of each fiscal year. Offer to NARA after 25 years.
VVET Logs*	Nonpermanent Quality EPI	7305	ENV1-e-6	Destroy when 75 years old.
RadCon Survey	Nonpermanent Quality	5308	A1-21.3	Destroy when 75 years old.

*VVET operations include the maintenance of a separate set of logs for each operating unit. Each set includes two log sheets to be completed daily, described as follows:

- Operating Log -- serves as a record for the operator's periodic observation and entry of instrument readouts and equipment operating parameters during their shift inspections.
- Narrative Sheet -- used to generate a history of conditions, events, problems, accomplishments, etc. for each unit. A record of sampling actions performed under this procedure will be maintained in this portion of the VVET operational logs.

6. REFERENCES

DOE/ID-10587, Quality Assurance Project Plan for Waste Area Groups 1, 2, 3, 4, 5, 6, 7, 10, and Inactive Sites[1]

Final Remedial Design/Remedial Action Workplan, Organic Contamination in the Vadose Zone, Operable Unit 7-08 (by Scientech Inc.), SCI-COM-200-95, Oct. 1995. Including any updates of the above document's elements as they are integrated into the site's configuration and document control systems.

INEEL-96/0119, Health and Safety Plan for the Vapor Vacuum Extraction with Treatment for the Organic Contamination in the Vadose Zone at the Radioactive Waste Management Complex, Operable Unit 7-08.

MCP-2980, Logkeeping

MCP-231, Logbooks

TPR-1628, VVET Unit Start-up, Operations, and Shutdown

7. APPENDICES

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[1] Applicable portions of the Quality Assurance Project Plan are implemented. Precision, accuracy, and comparability indicators are, however, limited to actions performed by the analytical laboratory. That is, no QA/QC samples are collected in the field.

APPENDIX A

Procedure Basis

Step	Basis	Reference
General	Work processes shall be accomplished using approved procedures, drawings, instructions, work packages or other appropriate means commensurate with the complexity and importance of the work.	PRD-101 7.2.1.2

VVET Thermal Oxidizer System Operability

Test Procedure

QTP-022

QUALIFICATION TEST PROCEDURE

VVET UNIT SYSTEM OPERATION TEST

Facility/System: VVET UNIT

REVIEWERS	Required (X)
RWMC Radiological Engineer	X
RWMC Rigging Engineer	
RWMC Industrial Safety Engineer	X
RWMC Quality Engineer	X
RWMC Industrial Hygienist	
RWMC Environmental Engineer	
RWMC Fire Protection Engineer	
RWMC Criticality Engineer	
RWMC System Engineer	X
RWMC Operations	X
OSB	X
RWMC WCO	
Other	

REVISION LOG

Rev.	Date	Affected Pages	Revision Description
0	09/09/99	All	QTP necessary to test VVET Unit System. See DAR: EO-RS-5002.
1	03/20/00	See revision bars throughout document.	Revised to incorporate equipment label changes. See DAR: EO-RS-5380.

CONTENTS

1. INTRODUCTION

1.1 Purpose

This procedure outlines steps required to test the functionality of the Vapor Vacuum Extraction Treatment (VVET) units. The VVET units are part of remedial actions for Operable Unit (OU) 7-8, Organic Contamination in the Vadose Zone (OCVZ), at the Radioactive Waste Management Complex (RWMC).

1.2 Scope and Applicability

This procedure applies in general to each of the three VVET units; that is, Units A, B and C. It describes steps to be taken by a qualified VVET technician to perform operation tests (or checks) on both the main system functions and the alarm system. This procedure is intended for use when a unit has been down for a significant period of time and/or when significant repairs or modifications have been made. It should be implemented as a means of verifying system operability before attempting normal operations. See Appendix A for Procedure Basis.

2. PRECAUTIONS AND LIMITATIONS

2.1 The main propane line manual valve, HCV-020A and HCV-020B (Unit A and B), HCV-020C (Unit C), will need to be closed until the pre- and post-purge steps have been tested. The main propane line manual valve can then be opened to test the ignition step.

2.2 During the preheat purge, the operator shall visually verify that FCV-210 and FCV-230 is opened, so the blower motor is not deadheaded.

2.3 The VVET technician shall also check the propane system to ensure all associated equipment is in good working order and that the valves are all in the proper configuration. With the main propane line valve closed per item 2.1, the manually operated propane hand valves on the oxidizer unit side of the main valve should be in the open position as follows:

A. HCV-223B in the line to the oxidizer unit's ignitor.

B. HCV-221A in the line to the oxidizer unit's preheater

C. HCV-221B in the line to the oxidizer unit's preheater

D. HCV-222A in the line to the fume/air sparger

E. HCV-222B in the line to the fume/air sparger.

2.4 A VVET technician shall ensure that all guarding equipment and electrical covers are in place and properly secure after significant repairs or modifications, and before system operation testing.

3. PREREQUISITES

3.1 VVET Technicians

3.1.1 Only VVET technicians meeting the training and experience requirements set by the OCVZ Program, as detailed in the VVET Training Plan and Qualification Card, are authorized to undertake the actions described in this procedure. The only exception to this requirement is for personnel involved in on-shift training and who are under the direct (and immediate) supervision of an authorized VVET technician.

3.2 VVET Unit

3.2.1 Power is supplied to the electrical cabinets and equipment.

3.2.2 All tags and lockouts have been properly removed.

3.2.3 Check for proper valve lineup. That is, check that all lines are connected and valves are in place, per normal operations.

3.2.4 IF a component is found out of its expected position, THEN evaluate equipment status and, as appropriate, reposition the component.

NOTE: *If there is any question about the effect repositioning could have on the system, the technician is to notify the OCVZ Manager prior to taking any action. If the component or components are repeatedly found to be out of the expected position, then the OCVZ Manager is to be contacted to initiate an investigation of the cause.*

4. INSTRUCTIONS

4.1 Main System Operation Checks

_____ 4.1.1 Ensure power is supplied to the unit by checking the green SYSTEM ON indicator light on the control panel.

_____ 4.1.2 Ensure the manually operated compressor isolation valves (that supply compressed air) are open. Valves in the main compressed air line that are to be in the open position are as follows:

A. HCV-910A at the discharge of the air compressor

B. HCV-910B at the inlet to the air drying and filtering equipment

C. HCV-910C at the outlet of the air drying and filtering equipment

D. HCV-911 and HCV-223A in the line leading to the oxidizer unit's preheater.

NOTE: *Valve HCV-910D is in a bypass line running parallel to the air drying and filtering equipment. It should remain closed as shown in the piping and instrument diagram (P&ID), unless the air drying and filtering equipment is intentionally being by-passed for maintenance or repair.*

_____ 4.1.3 Manually start the compressor and wait for the pressure to reach > 60 psig. The PURGE TO PILOT LOW PRESSURE ALARM light will de-energize when the pressure is > 60 psig.

_____ 4.1.4 Ensure that the isolation valves on the instrument air manifold (that provide air to the control valves and transmitters) are open. Valves on the instrument air manifold are identified as follows:

A. HCV-910J in the line to FY-200

B. HCV-910K in the line to YY-211

C. HCV-910L in the line to YY-230

D. HCV-910M in the line to YY-100

E. HCV-910N in the line to PY-100

F. HCV-910P in the line to YY-210

G. HCV-910Q in the line to YY-221

H. HCV-910R in the line to YY-222.

I. HCV-910S in the line to TY-341

_____ 4.1.5 Ensure that the uninterruptible power supply (UPS) system is on as indicated by the system indicator light.

_____ 4.1.6 Ensure that the manually operated valve, HCV-020A and HCV-020B (Units A & B), HCV-020C (Unit C), that supplies propane to the unit is closed.

_____ 4.1.7 Ensure that when the ESD push-button is pushed in that the control panel displays are off. Ensure that when the ESD push-button is pulled out that the panel displays are energized. Leave the ESD push-button in the pulled out position.

_____ 4.1.8 Press the check bulb push button to verify that all control panel lights (excluding the system indicator light) are working properly. Replace any bad bulbs.

_____ 4.1.9 Ensure that the FIC-210 is set to ~ 50%.

_____ 4.1.10 Press the SYSTEM ALARM RESET button located on the operator interface control panel. This should clear any existing alarms.

_____ 4.1.11 Press the PREHEATER START push button. Verify that the Programmable Logic Controller (PLC) does the following:

A. Energizes the ZAH-341 light if the FCV-341 valve is > 40%.

B. Opens the air/fume to oxidizer valve – FCV-210.

C. Opens the instrument purge air valve - FCV-911.

D. Opens the combustion air to burner valve - FCV-230.

E. Energizes the PALL-220 low pressure alarm light.

F. Closes the valves FCV-210, FCV-230, and FCV-911.

_____ 4.1.12 Use the Logicmaster 90 software to force the PSLL220 switch to show that the propane pressure is within the operating range.

_____ 4.1.13 Use the Eurotherm controller to ensure that the TIC-341 valve is set to ~ 20% - 30% valve open (must be < 40%).

_____ 4.1.14 Press the PREHEATER START push button. Verify that the PLC does the following:

A. Opens the air/fume to oxidizer valve - FCV-210.

B. Opens the instrument purge air valve - FCV-911.

C. Opens the combustion air to burner valve - FCV-230.

D. Starts the blower B-210 ~ 3 sec after pressing the PREHEATER START push button.

_____ 4.1.15 Verify that the preheater purging light is ON when the Unit starts the 5 min pre-purge state.

_____ 4.1.16 Verify that the blower runs for 5 min.

_____ 4.1.17 WHEN the 5 min pre-purge is completed,
THEN verify that the PLC automatically performs the following functions:

A. Closes the FCV-210 valve.

B. Closes the FCV-911 valve.

C. Opens the propane to pilot valve FCV-223.

D. Opens the FCV-211 valve.

_____ 4.1.18 Verify that the FCV-230 valve stays open.

_____ 4.1.19 Verify, by watching the Logicmaster 90 software, that the unit will try to ignite the pilot for 10 sec after the pre-purge is complete.

_____ 4.1.20 Verify that after the 10 sec "ignition start," the following occur:

A. The FCV-230 valve closes.

B. The FCV-223 valve closes.

C. The blower shuts down.

D. The BALL-330 flame relay no flame alarm light comes ON.

_____ 4.1.21 Remove the PSLL220 switch force using the Logicmaster 90 software.

_____ 4.1.22 Ensure that the manually operated valve, HCV-020A and HCV-020B (Unit A & B), HCV-020C (Unit C), that supplies propane to the Unit is opened.

_____ 4.1.23 Use the Eurotherm controller to ensure that the TIC-341 valve is set to ~ 20% to 30% valve open (must be < 40%).

_____ 4.1.24 Press the preheater start push button. Verify that the PLC does the following:

A. Opens the air/fume to oxidizer valve - FCV-210.

B. Opens the instrument purge air valve - FCV-911.

C. Opens the combustion air to burner valve - FCV-230.

D. Starts the blower B-210 ~ 3 sec after pressing the preheater start push button.

E. Energizes the preheater purging light.

_____ 4.1.25 Verify that the blower will run in this state and will pre-purge for 5 min.

_____ 4.1.26 WHEN the 5 min pre-purge is complete,
THEN verify that the "ignition start" is initiated and that the PLC automatically performs the following actions:

A. Maintains the FCV-230 valve open.

B. Closes the FCV-210 valve.

C. Closes the FCV-911 valve.

D. Opens the FCV-223 valve.

E. Opens the FCV-211 valve.

F. De-energizes the preheater purging light.

G. Tries to ignite the pilot for 10 sec as verified by watching the Logicmaster 90 software.

_____ 4.1.27 Verify by watching the Logicmaster 90 software that flame has been detected.

_____ 4.1.28 Verify by watching the Logicmaster 90 software that after flame has been detected, the FCV-221 valve opens and 10 seconds later the FCV-223 valve closes.

_____ 4.1.29 Verify that the BURNER ON light comes ON. The unit is now in the preheat state.

_____ 4.1.30 Verify that the unit will stay in the preheat state until the operator presses the STOP PREHEAT push button and all oxidizer bed temperatures are ≥ 1450°F. After the STOP PREHEAT push button has been pressed, verify that the following actions are performed by the PLC:

A. The TEMPERATURE HI/LO light is energized if any oxidizer bed temperatures are < 1450°F and that the unit will not roll into the profile state until the oxidizer bed temperatures are ≥ 1450°F.

B. The instrument purge air valve - FCV-911 opens.

C. The valve FCV-210 opens.

D. The air to burner valve - FCV-230 closes.

E. The valve FCV-221 closes.

F. The valve FCV-211 closes.

G. The valve FCV-222 opens.

H. The BURNER light goes OFF.

I. The PROFILE light comes ON.

_____ 4.1.31 Verify that the unit will stay in the Profile State and when all of the oxidizer bed temperatures are ≥ 1600°F, that the READY light is energized.

NOTE: *If the unit has not reached 1600°F and the HS-100 switch is turned to open, the unit should not roll into the run state and the TEMPERATURE HI/LO light should energize.*

_____ 4.1.32 Verify that when the ready light is on and the operator turns the fume to blower switch to open, the following actions are performed by the PLC:

A. The valve FCV-100 opens.

B. The PROFILE light goes OFF, and the PROCESSING light comes ON.

C. The unit continues to process until instructed by the Construction Engineer to shut down.

_____ 4.1.33 Verify that when the unit is processing and the system alarm reset button is pressed, the following actions are performed by the PLC:

A. The valve FCV-100 closes.

B. The PROCESSING light goes OFF.

C. The valve FCV-222 closes.

D. The blower continues to run in the postpurge state for 2 min.

E. After the 2 min purge, the blower shuts down and all unit valves close.

4.2 System Alarm Checks

NOTE: *Testing is required only on additional alarms or on modifications to existing alarms. If existing alarms have not been modified, then system alarm checks are not required.*

4.2.1 Checks Before Run State

_____ 4.2.1.1 Verify that when there is a low-pressure alarm on PSLL-220, the blower shuts down, all valves close, and the PALL-220 alarm light is energized.

_____ 4.2.1.2 Verify that only during the ignition start and preheat start states (when valve FCV-230 is opened) and there is a low pressure alarm on PSL-230, does the blower shut down, all valves close, and the PAL-230 alarm light energizes.

_____ 4.2.1.3 Verify that when there is a high-pressure alarm on PSHH-221, the blower shuts down, all valves close, and the PAHH-221 alarm light is energized.

_____ 4.2.1.4 Verify that when there is a high-pressure alarm on PSHH-222, the blower shuts down, all valves close, and the PAHH-222 alarm light is energized.

_____ 4.2.1.5 Verify that when there is a low pressure alarm on PSL-911, the blower shuts down, all valves close, and the PAL-911 PURGE TO PILOT LOW PRESSURE ALARM light is energized.

_____ 4.2.1.6 Verify that when there is a high temperature alarm, the blower shuts down and all valves close. Verify that the TEMPERATURE HI/LO light is energized.

_____ 4.2.1.7 Verify that when you are in the Profile State and there is a low temperature alarm, the blower shuts down and all valves close. Verify that the TEMPERATURE HI/LO light is energized.

_____ 4.2.1.8 Verify that when there is a low flow alarm, the blower shuts down, all valves close, and the FAL-210 alarm light is energized. If in the Profile State, the flow rate will need to remain below 250 SCFM for Units A and B, or 150 SCFM for Unit C, for 2 min before alarming. In the preheat purge mode, the flow rate will need to remain below 150 scfm for units A and B, or 75 scfm for unit C for 30 seconds before alarming. In any other state which requires the FCV-210 valve to be opened, the flow rate will need to remain below 250 SCFM for Units A and B, or 150 SCFM for Unit C, for 10 sec.

_____ 4.2.1.9 Verify that when the valve FCV-210 and FCV-230 are both closed that the blower shuts down and all valves close.

_____ 4.2.1.10 Verify that when the blower stop push button has been pressed, the blower shuts down and all valves close.

_____ 4.2.1.11 Verify that when in the preheater purge state and the FCV-341 valve is > 40% opened, the blower shuts down and all valves close. Verify that the ZAH-341 light is energized.

4.2.2 Checks During the Run State

_____ 4.2.2.1 Verify that when there is a low-pressure alarm on PSLL-220, the blower completes a 2 min postpurge and then shuts down, all valves close, and the PALL-220 alarm light is energized.

_____ 4.2.2.2 Verify that when there is a high-pressure alarm on PSHH-221, the blower completes a 2 min postpurge and then shuts down, all valves close and the PAHH-221 alarm light is energized.

_____ 4.2.2.3 Verify that when there is a high-pressure alarm on PSHH-222, the blower completes a 2 min postpurge and then shuts down, all valves close, and the PAHH-222 alarm light is energized.

_____ 4.2.2.4 Verify that when there is a low pressure alarm on PSL-911, the blower shuts down, all valves close, and the PAL-911 PURGE TO PILOT LOW PRESSURE ALARM light is energized.

_____ 4.2.2.5 Verify that when there is a high temperature alarm, the blower completes a 2 min postpurge and then shuts down and all valves close. Verify that the TEMPERATURE HI/LO light is energized.

_____ 4.2.2.6 Verify that when there is a low temperature alarm, the blower completes a 2 min postpurge and then shuts down and all valves close. Verify that the TEMPERATURE HI/LO light is energized.

_____ 4.2.2.7 Verify that if valve FCV-210 closes, the blower shuts down and all valves close.

5. RECORDS

Record Description	Classification	Uniform File Code	Disposition Authority	Retention Period
QTP-022 Case File	Lifetime Quality EPI	0276	A16-1.1	Cutoff at the end of each fiscal year. Offer to NARA after 25 years.
Executed QTP-022	Nonpermanent Quality EPI	8151	Pending A18-35.1-b	Submitted for Approval. DO NOT DESTROY.

VVET operations include the maintenance of a separate set of logs for each operating unit. Each set includes a round sheet and a narrative sheet to be completed daily. Performance of system operation testing and the results are to be recorded in the narrative log sheet.

6. REFERENCES

None

7. APPENDICES

See Table of Contents

APPENDIX A

Step	Basis	Reference
General	Work processes shall be accomplished using approved procedures, drawings, instructions, work packages or other appropriate means commensurate with the complexity and importance of the work.	PRD-101 7.2.1.2

VVET Thermal Oxidizer Logbook

INEEL VVET Narrative Log—Unit A (400 cfm)

Date: _____ Shift Hours: _____

OU#: 7-08 RWMC/OCVZ—Vapor Vacuum Extraction

Activities: (Total Manpower = _____)

Problems/Issues/Accidents:

Inspections/Visitors:

Individual Completing Log: (printed name) _____

(signature) _____

VVET Narrative Log - Unit A (400 cfm) - Continuation Sheet

VVET Operating Log - Unit A (400 cfm)

Date: _____ **Shift Hours:** _____

Time	Mode	Pressure PIC-100		Temp TIC-341-H		Flow FIC-210		PI-210B	TI-340	TI-341A	TI-341B	TI-341C	TI-341N	TI-341E	TI-341F	TI-341G	TI-341D	TI-341J	TI-341K	TI-342	PI-220	PI-222	PI-221	PI-210A	PI-230	PI-223	Flow-rate	Propane Level
		IWC	% Open	Deg F	% Open	CFM	% Open	In Hg	Deg F	Deg F	Deg F	Deg F	Deg F	Deg F	Deg F	Deg F	Deg F	Deg F	Deg F	Deg F	PSI	PSI	IWC	IWC	IWC	IWC	CFM	% Full
Normal Operating Ranges During **RUN** Mode		-140 to -50	100	1400 to 2100	< 38	> 250	NA	NA	< 400	1400 to 2100		< 700	1400 to 2100							< 1400	> 3.3	< 5.2	0	NA	0	0	NA	NA

	Initial
Panel Light Check:	
Daily Maintenance:	
Weekly Maintenance:	

	Time
Daily Influent Sample Collected	
Delivered to Laboratory	

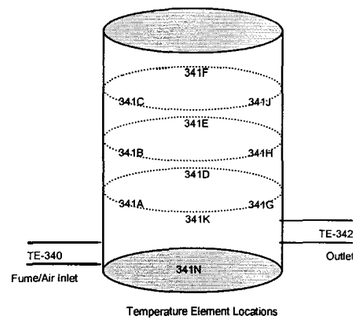
Operator Notes:

_____

_____

_____

_____



Temperature Element Locations

Individual Completing Log (printed name and signature): _____

VVET Thermal Oxidizer

Daily Roundsheet

RS-041

INEEL

412.09
(02/16/2000 - Rev. 05)

RWMC Round Sheet Radioactive Waste Management Complex	**DAILY VVET UNIT MECHANICAL INSPECTION**	Identifier: RS-041 Revision: 3 Page: 1 of 3
Document Control Center: (208) 526-2728	Document Owner: NFM	Effective Date: 07-02-01
Manual: N/A	**DRIVER: CERCLA**	Change Number: 32436 JSA Number(s): RWMC-276, -425

Document Opened: _____ Date: _____
Shift Supervisor (SS)

1. PRECAUTIONS AND LIMITATIONS

1.1 Entry into the organic contamination in the vadose zone (OCVZ) area on the Subsurface Disposal Area (SDA) requires one-time training to the Health and Safety Plan, INEL-96/0119.

1.2 Hearing protection is required in the enclosure if stay time exceeds 30 minutes.

1.3 Hard hats, safety glasses with side shields, and safety toe boots or safety toe shoes above the ankle are required while in the SDA.

1.4 Any out of specification reading or conditions must be reported to the SS.

1.5 Report any observed leaks or spills of petroleum products to the facility environmental engineer.

2. INSTRUCTIONS

2.1 Record comments or deficiencies in the narrative section and inform the SS.

2.2 Complete checks identified in Table 1 for Vapor Vacuum Extraction and Treatment (VVET) Units A and B.

Table 1. Equipment parameter/conditions.

Location/System	Min	Normal	Max	As Found
VVET UNIT A (VVEA-COM-910)				
Oil pressure	18 psig	18–20 psig	20 psig	
Unusual noise or vibration	NA	None	NA	
Oil leaks	NA	None	NA	
Air compressor leaks	NA	None	NA	
Air distribution system leaks	NA	None	NA	
Belt tension (visual check only)	NA	No Excessive Play	NA	
Check for water by opening drain valve on the bottom of the air compressor tank	None	Trace Amounts of Condensation	12 fl. oz.	
VVET UNIT A (VVEA-BLO-210)				
Belt tension (visual check only)	NA	No Excessive Play	NA	
VVET UNIT A (VVEA-DRY-110)				
Tower pressure	NA	Cycles Between Towers	NA	
VVET UNIT A (VVEA-VAB-140)				
Proper draining	NA	No Moisture/ Particulates/Oil	Trace Moisture/ Particulates/Oil	
VVET UNIT A (VVEA-FLT-130)				
Proper draining	NA	No Moisture/ Particulates/Oil	Trace Moisture/ Particulates/Oil	
VVET UNIT A (VVEA-VPR-020)				
Pilot light	N/A	ON	N/A	
VVET UNIT B (VVEB-COM-910)				
Oil pressure	18 psig	18-20 psig	20 psig	
Unusual noise or vibration	NA	None	NA	
Oil leaks	NA	None	NA	
Air compressor leaks	NA	None	NA	
Air distribution system leaks	NA	None	NA	
Belt tension (visual check only)	NA	No Excessive Play	NA	
Check for water by opening drain valve on the bottom of the air compressor tank	None	Trace Amounts of Condensation	12 fl. oz.	

RWMC Round Sheet Radioactive Waste Management Complex	**DAILY VVET UNIT MECHANICAL INSPECTION**	Identifier: RS-041 Revision: 2 Page: 3 of 3

Table 1. (continued.)

Location/System	Min	Normal	Max	As Found
VVET UNIT B (VVEB-BLO-210)				
Belt tension (visual check only)	NA	No Excessive Play	NA	
VVET UNIT B (VVEB-DRY-110)				
Tower pressure	NA	Cycles Between Towers	NA	
VVET UNIT B (VVEB-VAB-140)				
Proper draining	NA	No Moisture/ Particulates/Oil	Trace Moisture/ Particulates/Oil	
VVET UNIT B (VVEB-FLT-130)				
Proper draining	NA	No Moisture/ Particulates/Oil	Trace Moisture/ Particulates/Oil	
VVET UNIT B (VVEB-VPR-020)				
Pilot Light	N/A	ON	N/A	

Narrative Section:

Time Started: _____ Time Completed: _____

Performer: _____ Date: _____

Signature and Title
(MCP-1762, Appendix C, Item P25)

Reviewer: _____ Date: _____

Signature

Document Closed: _____ Date: _____

SS

VVET Catalytic Oxidizer Startup, Operating, Shutdown, and Sampling Procedure

TPR-1662

Technical Procedure Radioactive Waste Management Complex	**VVET CATALYTIC OXIDIZER STARTUP, OPERATION, AND SHUTDOWN**	Identifier: TPR-1662 Revision: 0 Page: 1 of 30
Document Control Center: (208) 526-2728	Document Owner: NFM	Effective Date: 07/11/01
Manual: RWMC Technical Procedures Manual	**USE TYPE 2**	Change Number: 32219 JSA Number: RWMC-016, -6572

STANDARD OPERATING PROCEDURE

VVET CATALYTIC OXIDIZER STARTUP, OPERATION, AND SHUTDOWN

Facility/System: VVET Catalytic Oxidizer Unit D

REVIEWERS	Required (X)
RWMC Radiological Engineer	X
RWMC Rigging Engineer	
RWMC Industrial Safety Engineer	X
RWMC Quality Engineer	X
RWMC Industrial Hygienist	X
RWMC Environmental Engineer	X
RWMC Fire Protection Engineer	X
RWMC Criticality Engineer	
RWMC System Engineer	
RWMC Operations	X
RWMC WCO	
Other	

REVISION LOG

Rev.	Date	Affected Pages	Revision Description
0	07/11/01	All	New TPR needed for VVET catalytic oxidizer startup, operation, and shutdown. See DAR No.: 32219

CONTENTS

1. INTRODUCTION

1.1 Purpose

The vapor vacuum extraction with treatment (VVET) catalytic oxidation unit is operated as part of environmental actions for Operable Unit 7-08, Organic Contamination in the Vadose Zone (OCVZ) at the Radioactive Waste Management Complex (RWMC).

1.2 Scope and Applicability

This procedure directs the startup, routine operation (including sampling), response to alarms, and shutdown of the VVET catalytic oxidation Unit D. Both non-emergency (Section 4.8) and emergency (Section 4.9) situations are covered under shutdown.

This procedure covers routine sampling of the process stream extracted from OCVZ wells (typically referred to as fume) after it is combined with ambient air. It covers VVET technician actions for the following:

- Collection of fume/ambient air samples
- Transportation of the samples to the Central Facilities Area (CFA) laboratory
- Documentation of sample information in the VVET Narrative Log and project file.

The sampling described in this document is in support of routine operations rather than the investigation and characterization efforts normally associated with Environmental Restoration (ER) projects. For this reason, the work is documented in the form of a technical procedure (TPR) rather than a sampling and analysis plan (SAP). However, because a SAP is the more traditional approach within the ER Program, this section of the procedure will be used to briefly address the elements commonly found in such a plan. The following discussion describes intended use of the data and measures taken to ensure that the data generated are suitable for their intended use.

Objectives and Data Use. The objective of this sampling effort is to obtain a representative sample of the influent streams of each of the VVET units. These fume/ambient air samples are then to be analyzed for OCVZ contaminants of concern for the vapor transport mode. The data quality objectives for the fume/ambient air sampling are to determine the amount of contaminants being processed through the VVET units and how contaminant concentrations change over time. The data will be used to one, generate estimates of the total mass of contaminants treated; two, generate estimates of contaminant emissions based on the estimated or calculated destruction efficiency of the VVET units; and three, track trends in contaminant concentrations over time.

Sampling Location and Frequency. Samples are collected daily from each operating VVET unit. The sample port is located on the discharge side of the vacuum blower (BLO-101). Sampling tables have not been prepared and are not used for this routine and limited sampling effort.

Sample Identification. The technician will mark the sample container with a unique sample identification number. Sample numbers for this routine, daily sampling will not be assigned by the Sample Management Office (SMO), and SMO sample labels will not be used.

Sampling Equipment and Procedures. Sampling equipment is limited to sample gas sampling bags and the VVET technician's Narrative Logbook to record the sampling event. The technician's personal protective equipment (PPE) is standard operating clothing including, specifically for the sampling event, leather gloves and safety glasses with side shields. Sample collection procedures are documented in this procedure.

Sample Handling, Packaging, and Shipping. Sample handling, packaging, and transfer requirements from MCP-244, Chain-of-Custody, Sample Handling, and Packaging for CERCLA Activities, have been incorporated into this TPR. Consistent with the graded approach, only MCP-244 requirements that establish the appropriate level of rigor for ensuring the integrity of the operational samples are included.

Documentation. Chain-of-custody (COC) forms are used for tracking samples. Involvement by the SMO (for example, performing administrative actions relative to the COC forms) is not required. The sample number, which explicitly indicates the date and time of sampling, is recorded in the VVET technician narrative logbook. Copies of the COC forms, with copies of data from the Bruel & Kjaer (B&K) analyzer, are maintained in the OCVZ VVET project file. The completed COC forms indicate that the samples have been dispositioned, thereby documenting that the COC form has served its purpose and can be filed. A copy of a completed COC form, with attached B&K data, is also sent to the OCVZ Project Manager. The samples are not tracked in the Integrated Environmental Data Management System.

Samples may be stored, prior to analysis, at ambient temperature for up to 28 days.

Handling and Disposition of Sampling Waste. The only wastes generated from this effort are the sample bags used to contain the fume/ambient air sample that are no longer usable. These bags have been characterized as cold waste.

2. PRECAUTIONS AND LIMITATIONS

2.1 Key Unit D operating parameters with corresponding limiting and design values are given in Table 1.

Table 1. Unit D limiting and design values for normal operations.

Operating Parameter	Minimum	Maximum	Design
Well Exit Temperature	55°F	200°F	125°F
Catalyst Inlet Temperature	850°F	1050°F	950°F
Catalyst Outlet Temperature	850°F	1050°F	975°F
Fume/Ambient Air Flow	300 scfm	550 scfm	500 scfm
Wellhead Pressure	0 in. w.c.	100 in. w.c.	50 in. w.c.

2.2 Unit D is equipped with a programmable logic controller (PLC). One of the PLC's functions is ensuring the oxidizer stays within acceptable operating conditions. The PLC will automatically shut down the oxidizer if it moves outside of the acceptable conditions. Table 5 provides the limits that delineate the acceptable operating conditions.

2.3 Operating the VVET units outside of the normal and acceptable operating conditions could result in poor efficiency with respect to destruction of organic contaminants in the fume or damage to the oxidizer unit and its components.

2.4 All personnel performing steps in this procedure must meet RWMC access training requirements.

2.5 Only VVET technicians listed on the RWMC Qualified Watch Standers List are authorized to undertake the actions described in this procedure. The only exceptions to this requirement are:

- personnel who are involved in on-shift training and who are under the direct and immediate supervision of an authorized VVET technician
- OCVZ technical support staff who are supporting an authorized VVET technician under Step 2.9
- electricians who are performing steps in Appendix D
- non-VVET technician B&K analyst receiving samples and returning empty sample bags.

2.6 Entry into the Unit D fenced area requires compliance with INEL-96/0119, Health and Safety Plan (HASP) that covers Unit D. This includes use of PPE specified by postings on the fence surrounding Unit D, and by postings for hearing protection requirements, if any, on the enclosure doors.

2.7 Enclosure doors must be secured from striking personnel during windy weather.

2.8 Transparent barriers must be in place inside of the cabinets (PP-600 and CP-800) to prevent worker exposure to electrical voltages in excess of 50 Vac when doors are opened.

2.9 Repairs, troubleshooting, and corrective maintenance that require craft work must be done per Standard (STD)-101, Integrated Work Control Process. However, VVET technicians are allowed to perform limited troubleshooting and adjustments/problem resolution following approval from the System Engineer (SE) or designated alternate.

2.10 Prior to leaving Unit D operating and unmanned between noncontiguous shifts, the VVET technician must ensure that the unit is in run mode and is operating in a safe and stable manner.

2.11 The Radiological Control Technician (RCT) Foreman must be notified when the system is opened and physical changes are made to vapor extraction wells or to the vapor vacuum extraction equipment.

2.12 Unit D has two alarm levels: one, warning alarms that alert the technician of an operating condition that does not (yet) warrant shutdown of the unit; and two, alarms that invoke, depending on the nature of the alarm condition, either an immediate shutdown or a shutdown following a two minute purge of the system.

3. PREREQUISITES

NOTE: *If a system operability test is required, it will be planned, conducted, and documented in accordance with Management Control Procedure (MCP)-3056, System Operability and Integrated Tests and MCP-1812, Qualification Test Program.*

3.1 A VVET system operability test has been performed if the unit has undergone significant repairs or modifications [as determined by the SE, ER Project Manager (PM), or the WAG 7 Field Operations Supervisor (FOS)].

3.2 The VVET technician must have access to two-way wireless communication (radio or cellular telephone), capable of contact with the RWMC Shift Supervisor (SS), while performing the activities outlined in this procedure.

3.3 Prior to completing steps in Section 4, the VVET technician has reviewed the log entries for the last calendar week or, if directed by the Operations Field Technician Lead (OFTL), for the period specified by the OFTL.

3.4 The SE has documented the desired setpoints for well 150 manifold temperature TE-151 and total system flow rate FT-101 in the Unit D Narrative Logbook.

3.5 Prior to performing sampling per Step 4.5.2, empty sample bags have been obtained from the laboratory (see Step 4.5.1.7).

3.6 An original or additional pre-job briefing has been performed, in accordance with MCP-3003, Performing Pre-job Briefings and Post-job Reviews, that covers, but is not limited to, the following:

A. HASP

B. potential hazards and hazard controls associated with SDA entry (JSA RWMC-276)

C. potential hazards and hazard controls associated with entering the Unit D fenced area, working within the enclosure, and with specific job steps (JSA RWMC-6572).

4. INSTRUCTIONS

4.1 General Instructions

NOTE 1: *A VVET technician performs the steps in Section 4.*

NOTE 2: *The following instructions involve the identification of VVET catalytic oxidizer components with truncated alphanumeric designations (for example FCV-107, instead of VVED-FCV-107) for ease of use of this procedure. Designated components can be found in the Piping and Instrumentation Diagrams (P&IDs).*

NOTE 3: *This procedure covers the four operational modes of the catalytic oxidizer. The four modes are discussed in Appendix B.*

NOTE 4: *Unless otherwise directed or allowed by this procedure, the technician will exit this procedure if a step cannot be competed. The technician will then notify the OFTL or SE.*

NOTE 5: *The technician may, but is not required to, consult with the OFTL or SE on what step is appropriate to reenter the procedure after a problem has been resolved (if the procedure was exited for that reason).*

4.1.1 Notify the RWMC SS and the OFTL of changes in a unit's status, abnormalities, difficulties encountered while performing assigned tasks, or other unexpected events.

NOTE: *The RCT foreman may require that an air sampling filter paper sample be changed out prior to resuming vapor extraction.*

4.1.2 Notify the RCT Foreman when vapor extraction for the VVET unit is interrupted and before vapor extraction is resumed.

4.1.3 GO TO the appropriate section specified in Table 2 based on the task to be completed.

Task to be Completed	Procedure Section
Perform pre-operational activities	4.2
Start up oxidizer	4.3
Perform routine surveillance and adjust parameters, if necessary	4.4
Sample fume/ambient air stream	4.5
Manual pumping of collected water from the V/L separator	4.6
Address warning alarms	4.7
Address shutdown alarms	4.8
Perform normal shutdown	4.9
Perform emergency shutdown	4.10
Post shutdown activities	4.11

4.2 Pre-Operational Activities

4.2.1 Walk down the areas outside and inside of the enclosure and observe both general conditions and the following specific items:

A. placement and condition of outside isolation barriers and postings

B. housekeeping

C. major equipment configuration (must be interconnected as shown on the P&IDs) and condition

D. lockout/tagouts (none are expected)

E. placement and condition of machine guarding

F. placement and condition of electrical covers

G. placement and verification of the fume/ambient air sample port cover

H. water level in V/L separator (must be below middle view port)

I. positions of well isolation valve FCV-101 (must be fully closed) and ambient air intake valve FCV-107 (must be fully open)

J. placement and condition of the two fire extinguishers

NOTE: *Item 4.2.1.H is resolved by performing Section 4.6.*

4.2.2 IF the results of the pre-operational walk down are not satisfactory, THEN ensure all problems are resolved prior to proceeding with this procedure.

WARNING

CP-800 contains 120 volts (V) conductors that could present an electrocution hazard.

NOTE 1: *Completion of Part A of Appendix C per Step 4.2.3 may require manipulation of valves within CP-800.*

NOTE 2: *The technician will consult with the OFTL or SE to determine the desired position of a component whose desired position is weather-dependent.*

4.2.3 IF directed by the OFTL or SE,
THEN position the components listed in Part A and/or B of Appendix C or ensure a component is already in the desired position.

4.2.4 IF the OFTL or SE directs that the positions of the components in PP-811 must be verified,
THEN have an electrician complete the steps in Appendix D.

4.2.5 IF the emergency shutdown (ESD) button is in the pushed-in position, AND the reason the ESD button is in the pushed-in position has been resolved,
THEN place the ESD button in the pulled-out position.

4.2.6 Ensure power is supplied to the skid by verifying that at least some lamps on PP-600 are illuminated.

4.2.7 Press the LAMP TEST button on the Operator Interface Terminal (OIT), ensure all bulbs on PP-600 are illuminated, and release the LAMP TEST button.

NOTE 1: *The technician may proceed with Step 4.2.8 if LMP-860, LMP-870, and/or LMP-880 fail to illuminate during completion of Step 4.2.7 (since the indicator lights are associated with equipment to be added in the future).*

NOTE 2: *The lights are 120 V and must be replaced by maintenance personnel.*

4.2.8 IF the OIT is indicating any alarms,
THEN ensure all alarm conditions indicated on the OIT have been corrected and clear all alarms from the OIT by acknowledging each alarm individually.

4.2.9 Position the Hand-Off-Auto (HOA) and Off-On switches specified in Table 3 or ensure the switches are already in the desired positions.

Table 3. Desired positions of HOA switches for unit startup.

Switch Number	Switch Association	Desired Position
HS-801	BLO-101 Extraction Blower	AUTO
HS-802	P-101 V/L Separator Drain Pump	OFF
HS-803	FCV-101 Well Isolation Valve	AUTO
HS-804	FCV-107 Auto Dilution Air Valve	AUTO
HS-805	P-102 Liquid Injection Pump	OFF
HS-850	Well HTR-150	ON[a]
HS-860	Well HTR-160 (not used)	OFF
HS-870	Well HTR-170 (not used)	OFF
HS-880	Well HTR-180 (not used)	OFF

a. HTR-150 will not be energized when HS-850 is placed in the ON position because of a control system interlock. The heater will come on in Step 4.3.2.

4.2.10 IF either the amber or red beacon is illuminated,
THEN GO TO Step 4.2.8, resolve the alarm condition(s), and return to this step.

4.2.11 Ensure FCV-112 is about 50% open as indicated by the valve positioner shaft.

4.2.12 IF the setpoint of total system process flow rate FT-101 on the OIT is NOT 350 cfm,
THEN adjust the setpoint to 350 cfm.

4.2.13 IF the setpoint of catalyst inlet temperature TE-301 on the OIT is NOT 950°F,
THEN adjust the setpoint to 950°F.

4.2.14 IF the setpoint of catalyst outlet temperature TE-302A on the OIT is NOT 975°F,
THEN adjust the setpoint to 975°F.

WARNING

Operation of the fume inlet manifold at a temperature higher than 125°F could result in personnel injury.

NOTE: *The temperature of TE-151 must be less than 125 °F.*

4.2.15 IF the setpoint of well 150 manifold temperature TE-151 on the OIT is NOT at the value specified by the SE (see Step 3.4),
THEN adjust the setpoint to the specified value.

4.3 VVET Unit Startup

4.3.1 Preheat Mode

WARNING

Operation of the blower without the guard in place is prohibited and could result in personnel injury.

NOTE: *Step 4.3.1.1 initiates a series of actions by the VVET system's PLC. In addition to completion of these specific steps, the technician must monitor the startup process and respond appropriately (for example, to warning or shutdown alarms).*

4.3.1.1 Press and release the START button on the OIT.

NOTE: *The control system is programmed to affect the following actions:*

A. Blower outlet recirculation valve FCV-112 stays at or moves to about 50% open as indicated by the orientation of the valve positioner shaft.

B. Blower BLO-101 starts as indicated by the sound of the blower operating or the indication of LMP-801.

C. Preheater HTR-201 is energized, as indicated by LMP-803, approximately 60 seconds after FT-101 reaches 200 scfm.

4.3.1.2 IF blower BLO-101 operates with unusual noise or vibration,
THEN IMMEDIATELY push and release the STOP button on the OIT, place the ESD button in the pushed-in position, or place HS-801 in the OFF position to shut down the blower.

WARNING

CP-800 contains 120 V conductors that could present an electrocution hazard.

4.3.1.3 Open the CP-800 door.

4.3.1.4 IF the transparent cover that prevents contact with exposed conductors is NOT in place,
THEN IMMEDIATELY close the CP-800 door, press and release the STOP button on the OIT to shut down the unit, and GO TO Section 4.11.

4.3.1.5 IF the indication of PDI-101 is showing minimum fluctuations,
THEN GO TO Step 4.3.1.7 without returning to this step.

NOTE: *When adjusted, HIV-108 and HIV-109 must NOT be in the fully closed position.*

4.3.1.6 Adjust hand isolation valves HIV-108 and HIV-109 to minimize observed pressure fluctuation at differential pressure indicator PDI-101.

4.3.1.7 Close and latch the CP-800 door.

4.3.2 Run Mode

NOTE 1: *The system will automatically move into run mode when the conditions described in Appendix B are achieved. The control system is programmed to effect the following actions for run mode:*

A. Well isolation valve FCV-101 opens, as indicated by LMP-801 (illuminated) and LMP-805 (not illuminated), to allow flow of fume to the oxidizer.

B. Well heater HTR-150 energizes, as indicated by LMP-850, after well flow FT-150 reaches 100 cfm.

NOTE 2: *The control system will automatically shut down Unit D if the conditions described in Appendix A are not achieved within 2 hours of pushing the START button.*

4.3.2.1 Using the OIT, adjust the setpoint of total system process flow rate FT-101 to a value between 300 – 550 scfm as documented by the SE in the Unit D Narrative Logbook (see Step 3.4).

4.3.2.2 Ensure that total system process flow FT-101 stabilizes at the setpoint.

4.3.2.3 IF the indication of PDI-150 is showing minimum fluctuation,
THEN GO TO Step 4.3.2.5 without returning to this step.

NOTE: *When adjusted, HIV-151 and HIV-152 must NOT be in the fully closed position.*

4.3.2.4 Adjust hand isolation valves HIV-151 and HIV-152 to minimize observed pressure fluctuation at differential pressure indicator PDI-150.

4.3.2.5 Ensure that catalyst inlet temperature TE-301 and well 150 manifold temperature TE-151 stabilize at their respective setpoints.

4.4 Routine Surveillance and Parameter Adjustment

NOTE 1: *Adjustments to the setpoints of total system process flow rate FT-101 and well 150 manifold temperature TE-151may be made upon approval of the SE (and documentation in the Unit D Narrative Logbook).*

NOTE 2: *Adjustments to the setpoints of catalyst inlet temperature TE-301 and catalyst outlet temperature TE-302A may be made upon approval of the PM or FOS (and documentation in the Unit D Narrative Logbook).*

4.4.1 Monitor system parameters (temperatures, flows, and pressures) consistent with good operating practices.

4.5 Fume/Ambient Air Stream Sampling

NOTE 1: *During completion of Section 4.5, a COC form (INEEL Form 435.20) is filled out in accordance with MCP-244, with additional information supplied as specified in this section. Multiple samples taken over multiple days may be documented on one COC if those samples are temporarily stored at the VVET units.*

NOTE 2: *When a sample storage box contains a sample(s), the corresponding COC form is included in the box with the sample(s).*

NOTE 3: *A tamper-indicating seal or a lock, with its key controlled by the SS, may be used to secure the sample storage box.*

4.5.1 Return of the Sample Storage Box to RWMC

4.5.1.1 After a sample storage box is returned from the CFA laboratory, check the sample bags to determine if they are empty and check the condition of the sample storage box, including the box's labels.

4.5.1.2 IF a sample bag(s) is not empty,
THEN, after making appropriate arrangements, return the bag(s), with the corresponding COC, to CFA for disposition.

4.5.1.3 IF the COC form does not indicate the samples have been dispositioned,
THEN contact the analyst and make arrangements to have the COC completed.

4.5.1.4 Attach a completed copy of the COC form and a copy of the associated B&K analyzer results in the project file to the corresponding copy of the COC form already in the project file.

4.5.1.5 Send a completed copy of the COC form and a copy of the associated B&K analyzer results to the OCVZ Project Manager.

NOTE: *Step 4.5.1.6 may be completed concurrent with Steps 4.5.1.3 through 4.5.1.5.*

4.5.1.6 IF the condition of the sample storage box is not good,
THEN resolve the problem with the box or replace the box and labels.

4.5.1.7 Secure the sample storage box and store at the appropriate VVET unit.

4.5.2 Sampling

4.5.2.1 IF the sample storage box is not secured,
THEN proceed only after approval by the OFTL or SE.

NOTE 1: *The sample storage box does not have to be resecured while the technician is in the immediate VVET area and can ensure there is no tampering with the box and its contents.*

NOTE 2: *A bag must not be used unless it is empty, intact, there is no visible contamination on or in the bag, and the bag has a label.*

4.5.2.2 Obtain an empty sample bag and a purge bag from the sample storage box.

NOTE 1: *The sample number consists of the unit designation, date, and time (for example A062501@0730).*

NOTE 2: *The sample storage box may be opened at any time for inspection by a VVET Technician, SE, or other person so directed by the OCVZ Project Manager or SS. The OFTL should be notified as soon as practical when and entry for inspection will or has been made.*

4.5.2.3 Write the sample number and initials of the person taking the sample on the label.

4.5.2.4 Don leather gloves.

WARNING

The sample port, filled purge bag, and filled sample bag may be hot and could cause burns.

NOTE: *The technician must ensure that personnel without proper PPE do NOT contact the hot sampling lines/sample bag.*

4.5.2.5 Remove the sample port protective cover.

4.5.2.6 Attach the purge bag (clearly labeled to distinguish it from a sample bag) to the sample port.

4.5.2.7 Open the purge bag valve.

4.5.2.8 Open valve HIV-111, flow fume/ambient air of about ¼ of the purge bag volume into the bag, and close valve HIV-111.

4.5.2.9 Close the purge bag valve.

4.5.2.10 Remove the purge bag from the sample port.

4.5.2.11 Attach the sample bag to the sample port.

4.5.2.12 Open the sample bag valve.

4.5.2.13 Open valve HIV-111, fill the sample bag about ¾ full, and close valve HIV-111.

4.5.2.14 Close the sample bag valve.

4.5.2.15 Remove the sample bag from the sample port.

4.5.2.16 Replace the sample port protective cover.

NOTE: *Leather gloves are no longer required after Step 4.5.2.16 is complete.*

4.5.2.17 Record sample number and initials of the person who took the sample in the narrative log for the specific VVET unit.

4.5.2.18 Place the sample bag and purge bag in the storage box, secure the box, and store the box at the VVET unit.

4.5.2.19 WHEN directed by the OFTL or SE,
THEN take sample bags and purge bag to Waste Management Facility (WMF)-601 for a radiological survey before they are transported to the laboratory for analysis.

4.5.2.20 IF the samples cannot be free released by RadCon personnel,
THEN the samples must be labeled and handled in accordance with the instructions from RadCon personnel.

4.5.2.21 Record on the COC form the time Radiological Control (RadCon) personnel free released the sample.

4.5.2.22 Place the COC form in the sample storage box and secure the box.

4.5.3 Transfer of Samples to CFA

NOTE: *Samples can be transferred to CFA by either a VVET technician or by a non-VVET technician analyst.*

4.5.3.1 IF the samples are to be analyzed by a non-VVET technician,
THEN record on the COC form the sample custody transfer with assistance from the non-VVET technician analyst.

4.5.3.2 IF transfer of the custody of samples is not required, THEN indicate that filling out the custody transfer section of the COC form is not required.

NOTE: *Sample analysis is not part of the scope of this procedure.*

4.5.3.3 Transport the sample bags and purge bag from RWMC to the CFA laboratory for analysis of the samples and disposition of the samples and purge material.

4.6 V/L Separator Liquid Manual Pump Out

WARNING

Liquid from the V/L separator may contain radioactive and/or chemical contamination.

NOTE 1: *Completion of Section 4.6 does not require, but is most efficiently accomplished with two people: one at PP-600 and the other near P-101.*

NOTE 2: *Follow directions on the applicable RWP during completion of the V/L separator liquid manual pump out.*

NOTE 3: *The technician must wear latex gloves when completing steps that might expose the technician to contact with liquid from the V/L separator.*

4.6.1 Connect the outlet hose to the fittings on P-101 outlet valve HIV-115 and on the collection container.

NOTE: *Rags or other absorbent material may be used as necessary to clean water from surfaces. Any spent rags or absorbent material must be managed as consistent with Steps 4.6.10 through 4.6.12.*

4.6.2 Open or ensure open HIV-102, HIV-113, HIV-115.

CAUTION

If pump P-101 is run dry, rotating parts may be damaged.

NOTE: *Step 4.6.4 must be performed shortly after Step 4.6.3.*

4.6.3 Place HS-802 in the HAND position to start pump P-101.

NOTE: *GLOBAL HAND SWITCH WARNING LMP-806 will flash when HS-802 is in the HAND position.*

4.6.4 IF the V/L separator water level decreases below the lower view port OR 5-gal of liquid are pumped into the collection container, THEN place HS-802 in the OFF position.

4.6.5 IF the V/L separator water level is below the lower view port, THEN GO TO Step 4.6.9.

4.6.6 Connect the outlet hose into another collection container and place the lid on the filled container.

4.6.7 Repeat Steps 4.6.3 through 4.6.7, as necessary, to empty the V/L separator.

4.6.8 Place the lid on the container.

NOTE: *The container(s) of water from the V/L separator must be managed as Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) waste unless and until analysis of the water and guidance from Waste Generator Services (WGS) staff calls for management under a different protocol. After process knowledge through analysis of a sufficient number of samples is established, WGS may provide waste management guidance based on process knowledge.*

4.6.9 Label the container(s) with label(s) obtained from the OFTL.

NOTE: *The container(s) must be held in a heated WAG 7 CERCLA waste storage area when freezing temperatures are expected.*

4.6.10 Place the labeled container(s) in a WAG 7 CERCLA waste storage area.

4.6.11 Request WGS staff to sample, analyze, and dispose of the water.

4.7 Warning Alarms

NOTE: *Warning alarms may occur during normal operation and are intended to signal the technician to inspect the operating system for conditions approaching the limitations of an operating limit. Warning alarms are accompanied by an energizing of the unit's amber strobe light. Warning alarms do not result in a curtailment of the unit's operation, but if the alarm conditions are not corrected, they may result in the activation of a shutdown alarm and the corresponding automatic shut down of the system.*

4.7.1 IF a warning alarm, as indicated by the OIT audible alarm, by the amber beacon light, or by Supervisory Control and Data Acquisition (SCADA), is activated,
AND if time permits (before the alarm condition clears or an automatic shutdown condition occurs),
THEN determine which alarm indicator is activated and troubleshoot to determine the cause of the alarm using the information in Table 4.

4.7.2 IF, after completion of Step 4.7.1, the system remains in a warning alarm status,
THEN take action to correct the condition.

4.7.3 IF another warning alarm is active,
THEN repeat Steps 4.7.1 and 4.7.2.

4.7.4 WHEN a warning alarm has been eliminated,
THEN return to the step that was in progress when the alarm occurred.

Table 4. Warning alarms (all energize amber beacon light).

Alarm/Panel Indicator	Setpoint	System Response	Corrective Action
Amber Beacon/ FT-101	225 scfm	Low total flow. Amber beacon will be energized if the process flow is below 225 scfm for 30 seconds.	Ensure that remote-controlled well isolation valve HIV-101 and manual well isolation HIV-150 are in the OPEN position in run mode. Ensure proper function of recirculation valve FCV-112.
Amber Beacon/ FT-101	525 scfm	High total flow. Amber beacon will be energized if the process flow is above 525 scfm for 30 seconds.	Verify that manual dilution air inlet valve FCV-106 is shut. Ensure proper function of recirculation valve FCV-112.

Alarm/Panel Indicator	Setpoint	System Response	Corrective Action
Amber Beacon/ TE-101	225°F	High blower discharge temperature. Amber beacon will be energized if the extraction blower discharge temperature exceeds 225°F for 30 seconds.	Ensure that the blower outlet is not at a high pressure (PI-102) and that process flow is at setpoint.
Amber Beacon/ TE-150A TE-151	60°F	Low well head or manifold temperature. Amber beacon will be energized if the well gas heater exit or well gas manifold entry temperature is below 60°F for 30 seconds. (Alarm active in run mode only.)	Ensure that well heaters are enabled and insulation is in place.
Amber Beacon/ TE-150A	150°F	High well head temperature. Amber beacon will be energized if the well gas heater exit temperature is above 150°F for 30 seconds. (Alarm active in run mode only.)	Ensure proper function of well heater. Ensure proper TE-151 control loop setpoint value.
Amber Beacon/ TE-151	120°F	High manifold temperature. Amber beacon will be energized if the well gas manifold entry temperature is above 120°F for 30 seconds. (Alarm active in run mode only.)	Ensure proper function of well heater. Ensure proper TE-151 control loop setpoint value.
Amber Beacon/ TE-301 TE-302	875°F	Low reaction temperature. Amber beacon will be energized if the catalyst bed inlet or outlet temperature drops below 875°F for 30 seconds. (Alarm active in run mode only.)	Ensure proper function of the preheater. Ensure proper TE-301 or TE-302 setpoint value.
Amber Beacon/ TE-301 TE-302	1025°F	High reaction temperature. Amber beacon will be energized if the catalyst bed inlet or outlet temperature rises above 1025°F for 30 seconds. (Alarm active in run mode only.)	Ensure proper function of the preheater. Ensure proper TE-301 or TE-302 setpoint value. Feed of organic materials at excessively high concentration may result in high reaction temperature. Test reactor inlet composition for organic content.
Amber Beacon/ TE-303	545°F	High exhaust temperature. Amber beacon will be energized if the exhaust temperature rises above 545°F for 30 seconds. (Alarm active in run mode only.)	Verify proper function of TE-303 and proper reaction temperature.
Amber Beacon/ TE-303	375°F	Low exhaust temperature. Amber beacon will be energized if the exhaust temperature falls below 375°F for 30 seconds. (Alarm active in run mode only.)	Verify proper function of TE-303 and proper reaction temperature.

Alarm/Panel Indicator	Setpoint	System Response	Corrective Action
Amber Beacon/ FT-150	125 scfm	Low well flow. Amber beacon will be energized if well flows drop below 125 scfm for 30 seconds. (Alarm active in run mode only.)	Ensure well isolation valve HIV-150 is open. Ensure proper function of differential pressure transmitter.
Amber Beacon/ FT-150	525 scfm	High well flow. Amber beacon will be energized if well flow rises above 525 scfm for 30 seconds. (Alarm active in run mode only.)	Ensure proper function of recirculation valve FCV-112 and the differential pressure transmitter.

4.8 Shutdown Alarms

WARNING

Shutdown alarms occur when limits of acceptable operation are exceeded during VVET unit operations and a continuation of the trend may result in potential personnel danger or equipment mechanical damage. Shutdown alarms result in a shut down of the unit and energizing of the red beacon light. Depending on the nature of the alarm, the unit may or may not go through a post run purge.

4.8.1 IF a shutdown alarm, as indicated by the OIT audible alarm, by the red beacon light operating, or by SCADA indication, is activated, THEN determine which alarm indicator is activated and troubleshoot the cause of the alarm using the information in Table 5.

4.8.2 WHEN the cause of the shutdown is determined, understood, and corrected, THEN GO TO Step 4.1.1 to initiate restart of the unit.

Table 5. Shutdown alarms (all energize red beacon light)

Alarm OIT Indicator	Setpoint	System Response	Corrective Action
Red Beacon/ FT-101	200 scfm	Low total flow. Red beacon will be energized if the process flow drops below 200 scfm for 30 seconds. The unit will enter Time Delayed Shutdown Mode. The system has 30 seconds for the flow to increase to minimum flow rate setpoint. If minimum flow is not satisfied within this time, the system will shut down.	Ensure well isolation valve HIV-101 and well isolation valve HIV-150 are in the OPEN position in run mode. Ensure proper function of recirculation valve FCV-112.
Red Beacon/ FT-101	550 scfm	High total flow. Red beacon will be energized if the process flow is above 550 scfm for 30 seconds. The unit will enter Time Delayed Shutdown Mode.	Verify proper function of recirculation valve FCV-112.
Red Beacon/ TE-101	250°F	Red beacon will be energized if the extraction blower discharge temperature exceeds 250°F. The unit will enter Instant Shutdown Mode.	Ensure that the blower outlet is not at a high pressure (PI-102) and that process flow is at setpoint.
Red Beacon/ TE-150A TE-151	55°F	Low well head or manifold temperature. Red beacon will be energized if the well gas heater exit or well gas manifold entry temperature is below 55°F. The system will enter Time Delayed Shutdown Mode. (Alarm active in run mode only. Once in run mode, 55°F must be achieved in 5 minutes.)	Ensure that well heaters are enabled and insulation is in place.
Red Beacon/ TE-150A	200°F	High well head temperature. Red beacon will be energized if the well gas heater exit is above 200°F. The unit will enter Time Delayed Shutdown Mode. (Alarm active in run mode only.)	Ensure proper function of well heaters. Ensure proper TE-151 control loop setpoint value.
Red Beacon/ TE-151	125°F	High manifold temperature. Red beacon will be energized if the well gas manifold entry temperature is above 125°F. The unit will enter Time Delayed Shutdown Mode. (Alarm active in run mode only.)	Ensure proper function of well heaters. Ensure proper TE-151 control loop setpoint value.

Alarm OIT Indicator	Setpoint	System Response	Corrective Action
Red Beacon/ TE-301 TE-302	850°F	Low reaction temperature. Red beacon will be energized if the catalyst bed inlet or outlet temperature drops below 850°F for 10 seconds. The unit will enter Time Delayed Shutdown Mode. (Alarm active in run mode only.)	Ensure proper function of the preheater. Ensure proper TE-301 or TE-302 setpoint value.
Red Beacon/ TE-301 TE-302	1050°F	High reaction temperature. Red beacon will be energized if the catalyst bed inlet or outlet temperature rises above 1050°F. The unit will enter Time Delayed Shutdown Mode. (Alarm active in run mode only.)	Ensure proper function of the preheater. Ensure proper TE-301 or TE-302 setpoint value. Feed of organic materials at excessively high concentration may result in high reaction temperature. Test reactor inlet composition for organic content.
Red Beacon/ TE-303	600°F	High exhaust temperature. Red beacon will be energized if the exhaust temperature rises above 600°F. The unit will enter Time Delayed Shutdown Mode. (Alarm active in run mode only.)	Verify proper function of TE-303 and proper reaction temperature.
Red Beacon/ TE-303	350°F	Low exhaust temperature. Red beacon will be energized if the exhaust temperature falls below 350°F for 10 seconds. The unit will enter Time Delayed Shutdown Mode. (Alarm active in run mode only.)	Verify proper function of TE-303 and proper reaction temperature.
Red Beacon/ FT-150	50 scfm	Low well flow. Red beacon will be energized if well flows drop below 50 scfm for 2 minutes. (The alarm will not reset until the flow reaches 70 scfm.) The unit will enter Time Delayed Shutdown Mode. (Alarm active in run mode only.)	Ensure wellhead isolation valves are open. Ensure proper function of differential pressure transmitter.
Red Beacon/ FT-150	550 scfm	High well flow. Red beacon will be energized if well flow rises above 550 scfm for 2 minutes. The unit will enter Time Delayed Shutdown Mode. (Alarm active in run mode only.)	Ensure proper function of recirculation valve FCV-112 and the differential pressure transmitter.

4.9 Normal Shutdown

NOTE: *The control system is programmed to effect the following actions:*

A. auto dilution air valve FCV-107 opens as indicated by LMP-808 energizing

B. pre-heater HTR-201 de-energizes as indicated by indicator lamp LMP-803 de-energizing

C. ten seconds after receiving the shutdown signal, well isolation valve, V-101, closes as indicated by LMP-805 energizing

D. well heater HTR-150 de-energizes as indicated by LMP-850 de-energizing

E. blower BLO-101 stops after a 2-minute purge as indicated by lack of sound of the blower operating or by indicator lamp LMP-801 de-energizing.

4.9.1 Press and release the STOP button on the OIT.

4.9.2 IF the system is to be promptly restarted,
THEN, upon direction from the OFTL or SE, GO TO Step 4.1.1 to initiate restart of the system.

4.9.3 IF the system is NOT to be promptly restarted,
THEN GO TO Step 4.11.1 and complete post shutdown activities.

4.10 Emergency Shutdown

NOTE: *The control system is programmed to effect the same actions as Step 4.9.1, except that blower BLO-101 stops immediately.*

4.10.1 Push in the ESD button on PP-600.

4.10.2 IF time permits (if an immediate evacuation is NOT required),
THEN GO TO Step 4.11.1.

4.11 Post Shutdown Activities

4.11.1 Place all HOA switches on PP-600 to the OFF position.

4.11.2 Close well isolation valve HIV-150.

4.11.3 Complete other post shutdown activities requested by the OFTL or SE, if any.

5. RECORDS

Record Description	Classification	Uniform File Code	Disposition Authority	Retention Period
TPR-1662 Case File	Permanent	0276	A16-1.1	Cutoff at the end of each fiscal year. Offer to NARA after 25 years.
Pre-job and Post-job Reviews and Checklists	Maintain in accordance with MCP-3003			
VVET Log Sheets[a]	Nonpermanent Quality	7305	ENV1-e-6	Destroy when 75 years old.

a. VVET operations include the maintenance of a separate set of logs for each operating unit. Each set includes two log sheets to be completed daily, described as follows:

- Operating Log serves as a record for the operator's periodic observation and entry of instrument readouts and equipment operating parameters during their shift inspections.
- Narrative Sheet is used to generate a history of conditions, events, problems, accomplishments, etc. for each unit.

6. REFERENCES

Companywide Manual 9, Operations

DOE/ID-10587, Quality Assurance Project Plan for Waste Area Groups 1, 2, 3, 4, 5, 6, 7, 10, and Inactive Sites

Electrical One-line Drawing (DWG-515650)

Final Remedial Design/Remedial Action Workplan, Organic Contamination in the Vadose Zone, Operable Unit 7-08 (by Scientech Inc., SCI-COM-200-95, Oct. 1995)

INEL-96/0119, Health and Safety Plan for the Vapor Vacuum Extraction with Treatment for the Organic Contamination in the Vadose Zone at the Radioactive Waste Management Complex, Operable Unit 7-08

INEL/EXT-99-00907, Field Sampling Plan for Operations and Monitoring Sampling Conducted in Support of the Organic Contamination in the Vadose Zone Remediation Project

MCP-1812, Qualification Test Program

MCP-244, Chain-of-Custody, Sample Handling, and Packaging for CERCLA Activities

MCP-3003, Performing Pre-job Briefings and Post-job Reviews

MCP-3056, System Operability and Integrated Tests

MCP-3562, Hazard Identification, Analysis, and Control of Operational Activities

Piping and Instrumentation Drawings (DWG-515640, -515641, and -515642)

STD-101, Integrated Work Control Process

7. APPENDICES

Appendix A, Procedure Basis

Appendix B, Catalytic Oxidizer Operational Modes

Appendix C, Component Line Up

Appendix D, PP-811 Circuit Breaker Positioning

APPENDIX A

Procedure Basis

Step	Basis	Reference
General	Activities affecting quality shall be prescribed by and performed in accordance with documented instructions, procedures, or drawings that include appropriate quantitative or qualitative acceptance criteria for determining that prescribed results have been satisfactorily attained.	PRD-5076 4.1.1.1
All	Work scope	King, Buck Technology HD CatOx™ Model HD-500 Operation & Maintenance Manual
All	Safe work	JSA RWMC-6572
Appendix D	Safe electrical verification work	JSA RWMC-016

APPENDIX B

Catalytic Oxidizer Operational Modes

The four operational modes of the VVET catalytic unit are described below:

Mode	Description	Cause of Entry into Mode
Preheat	Ambient air is drawn into the blower, preheated, and passed through the reactor. The catalyst bed inlet and outlet are heated to a minimum of 950°F and 850°F, respectively, and the exhaust is heated to 350°F.	Pushing the START button on the OIT.
Run	When system temperature is stabilized at the desired flow rate, processing of fume is initiated.	Completion of successful preheat cycle, at which time, the following conditions must exist: TE-301 ≥ 950°F TE-302 ≥ 850°F TE-303 ≥ 350°F TE-150A ≥ 55°F (This temperature must be achieved within 5 minutes after HIV-101 is opened.) TE-151 ≥ 55°F (This temperature must be achieved within 5 minutes after HIV-101 is opened.)
Time Delayed Shutdown	The system shuts down automatically. The blower remains on for 2 minutes after the system enters the time-delayed shutdown mode.	The system enters the time delayed shutdown mode when: the STOP button on the OIT is pressed any thermocouple signal is lost flow transmitter FT-101 signal is lost the vapor/liquid separator reaches the high-high level limit. HOA switches HS-801, HS-803, and HS-804 are not in the AUTO position any SCR is not functional high temperature on a temperature element
Instant Shutdown	The system shuts down automatically. The blower shuts down immediately upon the system entering the time-delayed shutdown mode.	The system enters instant shutdown mode when: the emergency shutdown button is pushed in there is an alarm condition on any of the following temperature switches: TS-801, TS-850, TS-860, TS-860, TS-870, TS-880 the blower motor is overloaded

APPENDIX C

Component Line Up

Part A: Manually Operated Valves

Valve Number	Related Component	Normal Pre-start Position	Comment
FCV-106	Ambient air inlet	Shut	
HIV-102	P-101 inlet	Closed	
HIV-113	P-101 outlet pressure gauge PI-103	Closed	
HIV-115	P-101 outlet	Closed	
HIV-150	Well isolation	Open	
HIV-160	Well isolation	Closed	
HIV-170	Well isolation	Closed	
HIV-180	Well isolation	Closed	
HIV-151	PDT-150 and PDI-150	Open	Valve is throttled to minimize pressure fluctuation to instrument.
HIV-152	PDT-150 and PDI-150	Open	Valve is throttled to minimize pressure fluctuation to instrument.
HIV-111	Process air sample	Closed	
HIV-110	PI-102	Open	Valve is inside of CP-800.[a]
HIV-108	PDT-101 and PDI-101	Open	Valve is inside of CP-800[a] and is throttled to minimize pressure fluctuation to instrument and normally won't be readjusted unless Step 4.3.1.6 is completed.
HIV-109	PDT-101 and PDI-101	Open	Valve is inside of CP-800[a] and is throttled to minimize pressure fluctuation to instrument and normally won't be readjusted unless Step 4.3.1.6 is completed.
HIV-195	Radiological continuous sampler subsystem inlet	Open	If valve is found unexpectedly closed, then the RCT foreman must be notified.
HIV-196	Radiological continuous sampler subsystem outlet	Open	If valve is found unexpectedly closed, then the RCT foreman must be notified.
HIV-105	PI-101 isolation	Open	
HIV-116	Blower oil drain	Closed	If valve is found open, actions must be taken to refill BLO-101 with oil.

a. Do not adjust valves inside of CP-800 if the transparent cover that prevents contact with the 120 V conductors is not in place. Close and latch the CP-800 cover if the transparent cover is not in place.

APPENDIX C

Part B - Electrical Power Supply (NO exposed conductors)

NOTE: *The RWMC SS must give approval prior to placing a breaker switch in the ON position if the breaker switch is found tripped (instead of being intentionally in the OFF position).*

Component Number or Breaker Location within LP1	Component Name (and Component Supplied)	Normal Pre-start Position	Comment
DSW-150	Disconnect switch (well head heater HTR-150)	ON	
DSF-811	Fused disconnect switch [CB-1 (LP1 via XFR-LP1) and CB-2 (DSF-UH2) within PP-811]	ON	
CB-600	Disconnect switch (PDB-601)	ON	
DSF-600	Fused disconnect switch [BLO-101, P-101, HTR-210 (both circuits), and HTR-150]	ON	
DSF-UH2	Fused disconnect switch (480 VAC enclosure heater)	ON	Can be placed in the OFF position during periods of above-freezing ambient temperatures.
13	Breaker switch (HTR-101)	ON	Can be placed in the OFF position during periods of above-freezing ambient temperatures.
15/17	Spare	OFF	
19/21	Breaker switch [UHTR-1 (240 VAC Enclosure heater)]	ON	Can be placed in the OFF position during periods of above-freezing ambient temperatures.
23	Breaker switch [HTT-101 (Well line heat tape)]	ON	A thermostat controls the heat tape, but no manual adjustment of the thermostat setpoint is required.
39/41	Breaker switch (Main-B phase/ Main-A phase)	ON	
14	Breaker switch (ACU-801)	ON	ACU-801 is located in the box attached to PP-600.
16	Breaker switch (PP-600 control panel)	ON	
18	Breaker switch [Skid light (east side)]	ON	

APPENDIX C

Component Number or Breaker Location within LP1	Component Name (and Component Supplied)	Normal Pre-start Position	Comment
20	Breaker switch (HTR-801, HTR-802)	ON	Both heaters have manually adjusted thermostats. HTR-801 is in PP-600 and HTR-802 is in CP-800.
22	Breaker switch (Enclosure lights & sensor light)	ON	
24	Breaker switch [Receptacles (enclosure and outside)]	ON	
26	Breaker switch [Receptacles (enclosure) & skid light (south)]	ON	

Part C - Electrical Power Supply (480 VAC exposed conductors)

NOTE 1: *The positioner for the circuit breakers in PP-811 must be an electrician.*

NOTE 2: *The steps in Appendix D must be followed to complete this component line-up task.*

NOTE 3: *If the breaker switch is found tripped (instead of being intentionally in the OFF position), the RWMC SS must give approval prior to placing a breaker switch in the ON position.*

Breaker Number within PP-811	Component Name (and Component Supplied)	Normal Pre-start Position	Comment
CB-1	Circuit Breaker (LP1 via XFR-LP1)	ON	
CB-2	Circuit Breaker (DSF-UH2)	ON	DSF-UH2 provides power to the 480 VAC enclosure heater.
CB-3	Spare Circuit Breaker	OFF	

APPENDIX D

PP-811 Circuit Breaker Positioning

NOTE 1: *The performer for all of the steps listed in Appendix D is an electrician.*

NOTE 2: *Completion of steps in Appendix D is required to verify the position of circuit breakers listed in Part C of Appendix C.*

1. Place fused disconnect switch DSF-811 in the OFF position or ensure the switch is in the OFF position.

> **WARNING**
>
> **PP-811 contains exposed 480 V conductors that could present an electrocution hazard.**

2. IF obstructions (for example, snow and ice) are present that would prevent use of an electrically rated insulating mat adjacent to PP-811,
   THEN have the obstruction removed.

3. Place the insulating mat on the ground adjacent to PP-811.

4. Ensure a back up electrician is present.

5. Open the cover of PP-811.

6. IF circuit breakers CB-1, CB-2, and CB-3 are in the required positions per Part C of Appendix C,
   THEN close and secure the cover
   AND GO TO Step 13.

7. Close the PP-811 cover.

8. Establish a flash protection boundary at 36 in.

9. Don face shield and Class 00 gloves.

10. Open the cover of PP-811.

11. Place breaker switches in the required positions per Part C of Appendix C.

APPENDIX D

12. Close and secure the cover of PP-811.

13. Remove the mat and the FPB (if Step 8 was completed).

14. IF requested by the OFTL,
THEN place fused disconnect switch DSF-811 in the ON position.

VVET Catalytic Oxidizer Integrated Test Procedure

TPR-1764

05/31/2001 [redacted]

412.11
02/16/2000
Rev. 05

DOCUMENT MA[illegible]TPR-1764 REV.1 DAR No. 32325 (PERMANENT FIELD CHANGE)
DOCUM[illegible]VVET CATALYTIC UNIT INTEGRATED TEST

9276.0000001508

1.	Document ID: TPR-1764	Current revision ID: 0			DAR No.: 32325	
2.	Document title: VVET Catalytic Unit Integrated Test					
3.	Requester: D. R. Moser	Phone: 8-8934	MS: 4208	E-mail: mosedr	S No.: 79081	
4.	Type: ☒ Document ☐ Drawing	5. Type of action: ☐ Create ☐ Revise ☒ Change ☐ Cancel				
6	Field Change: ☐ No ☒ Yes If Yes, will the change be ☒ Permanent? or ☐ Temporary? If temporary, enter the field change duration:					

7. Proposed action

Item	Page No./Section/Zone	Description	Justification
1	p. 16, Step 4.1.5.4.1; and p.29, Step 4.1.10.34	Change performer from "SS/ELEC" to "SS/Mechanic/TECH"	Assign proper craft to the task. The zero energy verification on page 16 will be done by an operational try which will require assistance from the TECH.
2	p. 16, Step 4.1.5.4.4; and p.29, Step 4.1.10.38	Change performer from "SS/ELEC" to "SS/Mechanic"	Assign proper craft to the task.
3	p. 16, Steps 4.1.5.4.2 and 4.1.5.4.3; and p. 29, Steps 4.1.10.35 and 4.1.10.36	Change performer from "PF" to "Mechanic"	Assign proper craft to the task.

8 Is this a minor document change? (See instructions for definitions.) ☒ No ☐ Yes – If yes, go to block 19 for final approval (and to block 13a if the change affects a NRC licensed facility).

9a Proposal approval: ☒ Accepted ☐ Deferred ☐ Rejected
If rejected, indicate reason.

Printed name: D. R. Moser

9b Does the proposal require hazard mitigation per MCP-3562 or -3571? ☒ No ☐ Yes

Signature: [signature] Date: 5/31/01

10. Actual action (if different from proposed)

Item	Page No./Section/Zone	Description	Justification

Review and resolution sheet(s) have been completed. JT 5/31-01

11. Indicate review method: ☐ Review board ☐ Design review board ☒ Other with signatures
Include a list of reviewers and review comments and resolutions with this form or have reviewers sign below.

Printed Name	Discipline	Org. No.	Signature	Date
W. Rick Harris	RadCon	5840	[signature]	5-31-01
J. O'Brien	Industrial Safety	5840	[signature]	5-31-01
G. LAW	Quality Engineer	5840	[signature]	5-31-01
Brian Perkins	Industrial Hygienist	7150	[signature]	5-31-01
Robert R. Nix	Fire Protection Engineer	5840	[signature]	5-31-01
T. D. Cline	Operations	7836	[signature]	5/31/01

12. Is document a TPR, EAR, or EPI procedure? ☐ No ☒ Yes If yes, indicate procedure validation method used:
☐ formal walkdown ☐ tabletop analysis ☐ limited trial use/field use ☒ partial validation ☐ N/A (minor change)

13a 10 CFR 72.48 USQ Process (NRC licensed facilities only)
☒ Not required – See MCP-2925 [illegible]
Screening Results (Attach form 431.48) ☐ Yes ☐ No
If yes, Evaluation Results (Attach form 431.49) ☐ Yes ☐ No

13b DOE Order 5480.21 USQ Process
☐ Not required—Categorically excluded by PRD-113 or minor document change or already screened elsewhere.
Screening form attached? ☐ Yes ☒ No
Screening Results: ☐ Yes ☒ No
If yes, Evaluation Results (Attach form 431.20 or equivalent) ☐ Yes ☐ No

Page 1

2

412.11
02/16/2000
Rev. 05

DOCUMENT MANAGEMENT CONTROL SYSTEM (DMCS)
DOCUMENT ACTION REQUEST (DAR)

1. Document ID: TPR-1784	Current revision ID: 6	DAR No.: 22125

Printed name: Signature: 10 CFR 72.48 Qualified Screener — Date	Printed name: D. S. Swanson Signature: [signature] 5/31/01 USQ Qualified Facility Screener — Date
14. ☒ Change does not affect a permitted area and does not affect a TSD facility. RCRA evaluation is not required. Is RCRA permit/application modified? ☐ No ☐ Yes ☐ Unknown If yes or unknown, attach or reference completed form 435.29 below.	Printed name: Norm Stanley Signature: [signature] Date: 5/31/01

15. Does this action qualify as a periodic review? ☒ No ☐ Yes ☐ N/A

16. Is there training associated with this action? ☒ No ☐ Yes - If yes - Define training and audience: [illegible] 5-31-01
No Training is Expected. This Change is Just to [illegible] [illegible] [illegible] [illegible] LOT.

17. After considering implementation tasks and training, establish effective date for document: 5-31-01

18. Other documents affected by this action: None

19. Final Approval (Document Owner)—*Approval indicates correct review signatures, validation completed (if applicable), MCP-3562 or MCP-3571 process completed (if applicable); and no pending USQ or RCRA actions.*

Printed name:	Signature:	Date:
A.E. Millhouse	[signature]	5/31/01

20. Released by: [signature]	21. Document Control location: RWMC WMF-613	22. Release date: 5/3/01
23. Comments:		24. New revision ID:

Page 2

Technical Procedure Radioactive Waste Management Complex	**VVET CATALYTIC UNIT INTEGRATED TEST**	Identifier: TPR-1764 Revision: 0 Page: 1 of 47
Document Control Center (208) 526-2728	Document Owner: D.R. Moser Document Approver: NFM	Effective Date: 05/09/01
Manual: RWMC Technical Procedures Manual	**USE TYPE 1**	Change Number: 32017 JSA Number: RWMC-6613

INTEGRATED TEST PROCEDURE
VVET CATALYTIC UNIT INTEGRATED TEST

Facility/System: VVET Catalytic Oxidizer Unit D

REVIEWERS	Required (X)
RWMC Radiological Engineer	X
RWMC Rigging Engineer	
RWMC Industrial Safety Engineer	X
RWMC Quality Engineer	X
RWMC Industrial Hygienist	X
RWMC Environmental Engineer	
RWMC Fire Protection Engineer	X
RWMC Criticality Engineer	
RWMC System Engineer	X
RWMC Operations	X
OSB	X

REVISION LOG

Rev.	Date	Affected Pages	Revision Description
0	05/09/01	All	Create an integrated test procedure needed for VVET catalytic oxidizer integrated testing. See DAR No. 32017.

WASTE MANAGEMENT PROGRAMS
RWMC/SWEPP OPERATIONS

PERSONNEL BRIEFING LOG

Work approved:

_____ _____
RWMC Shift Supervisor Date

NOTE: *Obtain and use formal pre-job briefing and post-job review sheets from Management Control Procedure (MCP)-3003.*

INEEL Form 434.14 Pre-job Briefing Checklist
INEEL Form 434.15 Pre-job Briefing Attendance Record
INEEL Form 433.24 Post-job Review Checklist

Attach completed forms to this technical procedure (TPR).

Job Supervisor or Foreman: When any of the following conditions exist, repeat the pre-job briefing for the same activity:

A. during the work activity, area conditions have changed which may affect the safety of employees, public, or the environment

B. facility conditions have changed, such as going from normal operations to an outage condition

C. work scope has changed

D. personnel assignments have changed or new personnel are added

E. work has stopped for a period of greater than 7 days

F. employee or management requests completion of another pre-job briefing.

_____
Job Supervisor or Foreman Signature

CONTENTS

1. INTRODUCTION

1.1 Purpose

The purpose of the integrated test procedure is to ensure the overall performance of the vapor vacuum extraction and treatment (VVET) catalytic Unit D. The VVET Unit D is part of the remedial action for Operable Unit 7-08, Organic Contamination in the Vadose Zone (OCVZ), at the Radioactive Waste Management Complex (RWMC) Subsurface Disposal Area (SDA).

1.2 Scope and Applicability

This procedure applies to the VVET Unit D. It describes steps taken by an authorized VVET technician and supporting personnel to perform integrated testing on the main system functions, the alarm system, and the supervisory control and data acquisition system (SCADA). The scope of the integrated test includes the CatOx HD oxidizer, 225 kVA transformer, alarm beacons, warning alarms, control system, and the well head heater.

2. PRECAUTIONS AND LIMITATIONS

2.1 Transparent barriers must be in place inside of the cabinets (PP-600 and CP-800) to prevent worker exposure to electrical voltages in excess of 50 volts (V) when doors are opened outside of a lockout.

2.2 Laser Safety Briefing (TRN-163) must be completed prior to using the infrared temperature measuring device for surface temperature measurements.

2.3 All personnel undertaking the actions described in this procedure must work under the direction of the Operation Field Technician Lead (OFTL).

2.4 Entry into the fenced area requires compliance with the OCVZ Health and Safety Plan (HASP). This includes use of personnel protective equipment (hard hat, safety glasses with side shields, and safety-toe boots above the ankle) and familiarity with the hazard list and designated administrative and engineering controls.

2.5 During windy weather, enclosure doors must be secured to prevent them from striking personnel.

2.6 When personnel are in the Unit D fenced area, they must have access to wireless communication (for example, a radio or cell phone).

3. PREREQUISITES

3.1 The following designated crew members (at a minimum) have been qualified and are available:

A. Electrical Engineer (EE)

B. Test Engineer (TE)

C. System Engineer (SE)

D. Pipe Fitter (PF)

E. Instrument Technician (IT)

F. Industrial Hygienist (IH)

G. Health and Safety Officer (HSO)

H. VVET Technician (VVETTECH)

I. OFTL

J. Electrician (ELEC)

K. RWMC Shift Supervisor (SS)

3.2 The SS, and Radiological Control Technician (RCT) Foreman have been notified prior to start of operation of Unit D and will be notified following shut down.

3.3 The OFTL or designee has walked down the areas inside and outside of the enclosure and has verified that the areas and equipment are satisfactory for testing to begin. Specific items to be checked include, but may not be limited to, the following:

A. outside isolation barriers and proper postings are in place

B. construction equipment and material, if any is present, does not present a hazard

C. the well head is configured to draw in ambient air and the well is closed

D. all applicable lockout/tagouts have been released

E. all machine guarding is in place

F. all electrical covers are in place

G. valves with clutches are unclutched

H. all equipment is connected as shown on the piping and instrumentation diagrams (P&IDs).

3.4 The OFTL or designee has completed a pre-job briefing for personnel working under this procedure. Specific items to be covered in the pre-job briefing include, but are not limited to, the following:

A. HASP

B. verification of RWMC access training

C. assurance of escort requirements/availability and completion of required training for escorted personnel

D. potential hazards and hazard controls associated with SDA entry (JSA RWMC-276)

E. potential hazards and hazard controls associated with entering the Unit D fenced area, working within the enclosure, and with specific job steps (JSA RWMC-6613)

F. work under this procedure will be done under the direction of the OFTL.

3.5 The EE must ensure that all electrical components are in the correction position.

3.6 The OFTL must ensure that an adequate supply of deionized (DI) water bottles, as specified by the SE, are available for the test.

3.7 The equipment has been turned over by construction to operations for testing.

3.8 The HSO has been requested to perform surveillances at the HSO's discretion.

4. INSTRUCTIONS

NOTE 1: *Component identifiers are truncated for ease of use. For example, VVED-V-101 will be called out as V-101 in this procedure.*

NOTE 2: *The TE is responsible for correct displays on the SCADA and Operator Interface Terminal (OIT) screens. If the readings are not correct, the TE will make the necessary changes to the SCADA database or any other changes to correct the readings prior to continuing with the integrated test (unless otherwise specified in this procedure). The TE may switch to other SCADA screens or access the SCADA database for troubleshooting and problem resolution, and then return to the "current" (per the procedure) SCADA screen.*

NOTE 3: *Unless otherwise directed or allowed by this procedure, the performer will exit this procedure if a step cannot be completed.*

NOTE 4: *IF the procedure must be exited and a problem resolved, THEN the SE or TE will specify the appropriate step at which to reenter the procedure after the problem is resolved.*

NOTE 5: *IF an OIT or SCADA message does not match verbatim the statement given in this procedure, THEN the TE will determine if the message is satisfactory as-is or must be changed.*

4.1 Main System Operation Checks

NOTE 1: *Ladder programming may need to be forced to produce alarms or other anticipated outputs.*

NOTE 2: *# signs will be filled in with the existing value held in the Programmable Logic Controller (PLC) register.*

_____ 4.1.1 VVETTECH: Complete preoperational valve positioning.

_____ 4.1.1.1 Close well isolation valves V-160, V-170, and V-180.

_____ 4.1.1.2 Unclutch FCV-112, V-101, FCV-107.

_____ 4.1.2 VVETTECH: Press and hold the LAMP TEST button on the OIT.

_____ 4.1.2.1 Ensure all indicator lamps are illuminated.

_____ 4.1.2.2 IF a lamp fails to illuminate,
THEN notify the OFTL to have the bulb replaced before proceeding.

NOTE: *Panel indicator lamps are supplied 120 V electricity and must be replaced by qualified personnel only.*

_____ 4.1.3 VVETTECH: Clear any alarms from the OIT.

NOTE: *Up to 10 alarms requiring acknowledgement and clearing may be stored in the OIT.*

_____ 4.1.3.1 Press the ALARM ACK button to display the alarm message.

_____ 4.1.3.2 Document each alarm message in the VVET Unit D Logbook.

_____ 4.1.3.3 Ensure the cause of the alarm is resolved before proceeding.

_____ 4.1.3.4 Press ALARM RESET to clear the alarm message.

_____ 4.1.3.5 Repeat Steps 4.1.3.1 through 4.1.3.4 as necessary to clear all the alarms.

_____ 4.1.4 TE: Check OIT and SCADA operator interface alarm.

NOTE 1: *All discrepancies are documented in the VVET Unit D Logbook.*

NOTE 2: *Any of the following steps can be performed or repeated as long as VVET Unit D is not operating.*

NOTE 3: *The TE will clear the OIT display messages, as needed.*

NOTE 4: *The TE will ensure that ladder logic forces are removed following completion of the test.*

_____ 4.1.4.1 TE: In the ladder logic, force N7:99 to equal 70.

4.1.4.1.1 Ensure the OIT display and the SCADA operator interface screen read: "ALARM! Possible Open Circuit on Thermocouples. Service Required."

_____ 4.1.4.2 TE: In the ladder logic, force N7:99 to equal 71.

4.1.4.2.1 Ensure the OIT display and the SCADA operator interface screen read: "ALARM! Possible Open Circuit on Process Vapor Flow Rate Transmitter PDT-101. Service Required."

_____ 4.1.4.3 TE: In the ladder logic, force N7:99 to equal 72.

4.1.4.3.1 Ensure the OIT display and the SCADA operator interface screen read: "Catalyst Inlet Low Temperature Limit. Timed Shut Down, ### Seconds Remaining."

_____ 4.1.4.4 TE: In the ladder logic, force N7:99 to equal 73.

4.1.4.4.1 Ensure the OIT display and the SCADA operator interface screen read: "Catalyst Exit Low Temperature Limit. Timed Shut Down, ### Seconds Remaining."

_____ 4.1.4.5 TE: In the ladder logic, force N7:99 to equal 74.

4.1.4.5.1 Ensure the OIT display and the SCADA operator interface screen read: "CatOx Heat Exchanger Discharge Low Temperature Limit. Timed Shut Down, ### Seconds Remaining."

_____ 4.1.4.6 TE: In the ladder logic, force N7:99 to equal 75.

4.1.4.6.1 Ensure the OIT display and the SCADA operator interface screen read: "TE301= #,### F ALARM! TE301= #,### F Catalyst Inlet High Temperature Limit.

_____ 4.1.4.7 TE: In the ladder logic, force N7:99 to equal 76.

4.1.4.7.1 Ensure the OIT display and the SCADA operator interface screen read: "TE302= #,### F ALARM! TE302= #,### F Catalyst Exit High Temperature Limit.

_____ 4.1.4.8 TE: In the ladder logic, force N7:99 to equal 77.

4.1.4.8.1 Ensure the OIT display and the SCADA operator interface screen read: "TE303= #,### F ALARM! TE303= #,### F CatOx Heat Exchanger Discharge High Temperature Limit."

_____ 4.1.4.9 TE: In the ladder logic, force N7:99 to equal 78.

4.1.4.9.1 Ensure the OIT display and the SCADA operator interface screen read: "TE101= #,### F ALARM! TE101= #,### F CatOx Heat Exchanger Discharge High Temperature Limit."

_____ 4.1.4.10 TE: In the ladder logic, force N7:99 to equal 79.

4.1.4.10.1 Ensure the OIT display and the SCADA operator interface screen read: "ALARM! Catalyst Exit High Temperature Limit Switch TS-801 Activated. Acknowledge alarm and press Alarm Reset."

_____ 4.1.4.11 TE: In the ladder logic, force N7:99 to equal 81.

4.1.4.11.1 Ensure the OIT display and the SCADA operator interface screen read: "SCR-603 NOT FUNCTIONAL. Timed Shut Down, ### Seconds Remaining."

_____ 4.1.4.12 TE: In the ladder logic, force N7:99 to equal 82.

4.1.4.12.1 Ensure the OIT display and the SCADA operator interface screen read: "SCR-604 NOT FUNCTIONAL. Timed Shut Down, ### Seconds Remaining."

_____ 4.1.4.13 TE: In the ladder logic, force N7:99 to equal 83.

4.1.4.13.1 Ensure the OIT display and the SCADA operator interface screen read: "EMERGENCY STOP ENGAGED. Acknowledge alarm and press Alarm Reset. Timed Shut Down, ### Seconds Remaining."

_____ 4.1.4.14 TE: In the ladder logic, force N7:99 to equal 84.

4.1.4.14.1 Ensure the OIT display and the SCADA operator interface screen read: "Extraction Blower BLO-101 Motor Overload. Acknowledge alarm and press Alarm Reset. Timed Shut Down, ### Seconds Remaining."

_____ 4.1.4.15 TE: In the ladder logic, force N7:99 to equal 85.

4.1.4.15.1 Ensure the OIT display and the SCADA operator interface screen read: "V/L Sep Drain Pump P-101 Motor Overload. Acknowledge alarm and press Alarm Reset. Timed Shut Down, ### Seconds Remaining."

_____ 4.1.4.16 TE: In the ladder logic, force N7:99 to equal 91.

4.1.4.16.1 Ensure the OIT display and the SCADA operator interface screen read: "Total Process Vapor Flow Rate Low Limit. Timed Shut Down, ### Seconds Remaining."

_____ 4.1.4.17 TE: In the ladder logic, force N7:99 to equal 93.

4.1.4.17.1 Ensure the OIT display and the SCADA operator interface screen read: "ALARM! Vapor Liquid Separator High Limit High Level Alarm, LSHH-100.

_____ 4.1.4.18 TE: In the ladder logic, force N7:99 to equal 100.

4.1.4.18.1 Ensure the OIT display and the SCADA operator interface screen read: "The Auto Dilution Air Valve FCV-107 must be in the Full Open Position before the System will START."

_____ 4.1.4.19 TE: In the ladder logic, force N7:99 to equal 101.

4.1.4.19.1 Ensure the OIT display and the SCADA operator interface screen read: "The Well Isolation Valve V-101 must be in the Full Closed Position Before the System Will START."

_____ 4.1.4.20 TE: In the ladder logic, force N7:99 to equal 102.

4.1.4.20.1 Ensure the OIT display and the SCADA operator interface screen read: "The system will not START unless ALL hand-off-auto switches are in the AUTO POSITION."

_____ 4.1.4.21 TE: In the ladder logic, force N7:99 to equal 105.

4.1.4.21.1 Ensure the OIT display and the SCADA operator interface screen read: "Timed Shut Down in Progress, ### seconds remaining."

_____ 4.1.4.22 TE: In the ladder logic, force N7:99 to equal 106.

4.1.4.22.1 Ensure the OIT display and the SCADA operator interface screen read: "Acknowledge ALL alarms and press ALARM RESET prior to restarting."

_____ 4.1.5 VVETTECH: Ensure the SCADA data and the condition of status lamps are consistent with the positions of hand switches HS-801, HS-802, HS-803, HS-804, and HS-805 and with the status of their associated controlled components.

_____ 4.1.5.1 At PP-600, place hand switches HS-801, HS-802, HS-803, HS-804, and HS-805 to the AUTO position and ensure the amber lamp LMP-806 and the amber beacon are NOT illuminated.

_____ 4.1.5.2 View the control panel screen on the SCADA.

4.1.5.3 HS-801, BLO-101 Extraction Blower

_____ 4.1.5.3.1 VVETTECH: Place FCV-106 in the OPEN position.

WARNING

Operation of the blower without the guard in place is prohibited and could result in personnel injury.

NOTE: *In Step 4.1.5.3.2, an IH must perform an initial (even if limited) noise survey when the blower is started and run for a brief period. The IH will establish, if needed, preliminary hearing protection requirements for the remainder of the procedure or until a more complete survey can be conducted and evaluated.*

_____ 4.1.5.3.2 VVETTECH: Place HS-801 in the HAND position and ensure blower BLO-101 starts and operates without unusual noise or vibration.

_____ 4.1.5.3.3 VVETTECH: IF BLO-101 operates with unusual noise or vibration,
THEN IMMEDIATELY place HS-801 in the OFF position to shut down the blower.

_____ 4.1.5.3.4 VVETTECH: Ensure the SCADA screen position indication matches the position of HS-801 located on panel PP-600.

_____	4.1.5.3.5	VVETTECH: Ensure LMP-806 is flashing on PP-600 and flashing yellow on the SCADA screen.
_____	4.1.5.3.6	VVETTECH: Ensure LMP-801 is illuminated on PP-600 and on the SCADA screen.
_____	4.1.5.3.7	VVETTECH: View the process screen on the SCADA.
_____	4.1.5.3.8	VVETTECH: Ensure when blower motor MO-101 is on, the pulleys and belt for MO-101 and BLO-101 are rotating on the SCADA screen.
_____	4.1.5.3.9	VVETTECH: View the status screen on the SCADA.
_____	4.1.5.3.10	VVETTECH: Ensure when BLO-101 is running, the BLO-101 status block on the SCADA indicates "BLO-101 ON" in green in the first display and "CURRENT OKAY" in green in the second display.
_____	4.1.5.3.11	VVETTECH: Place HS-801 in the OFF position.
_____	4.1.5.3.12	VVETTECH: Ensure when BLO-101 is not running, the BLO-101 status block on the SCADA indicates "BLO-101 OFF" in red in the first display and "CURRENT OKAY" in green in the second display.
_____	4.1.5.3.13	VVETTECH: View the process screen on the SCADA.
_____	4.1.5.3.14	VVETTECH: Ensure when blower motor MO-101 is off, the pulleys and belt for MO-101 and BLO-101 are stopped on the SCADA screen.
_____	4.1.5.3.15	VVETTECH: View the control panel screen on the SCADA.

_____ 4.1.5.3.16 VVETTECH: Ensure the SCADA screen position indication matches the position of HS-801 located on panel PP-600.

_____ 4.1.5.3.17 VVETTECH: Ensure LMP-806 is not flashing on PP-600 or flashing yellow on the SCADA screen.

_____ 4.1.5.3.18 VVETTECH: Ensure LMP-801 is NOT illuminated on PP-600 and on the SCADA screen.

_____ 4.1.5.3.19 VVETTECH: Return HS-801 to the AUTO position.

_____ 4.1.5.3.20 VVETTECH: Ensure the SCADA screen position indication matches the position of HS-801 located on panel PP-600.

4.1.5.4 HS-802, P-101 V/L SEP Drain Pump

_____ 4.1.5.4.1 SS/ELEC: Lockout/tagout DSF-600.

NOTE: *Other craft personnel or a VVETTECH(s) must support the PF, when performing Steps 4.1.5.4.2 and 4.1.5.4.3, as follows:*

A. ensuring stability of the step ladder

B. having the PF hand down the lid and demister pad separately

C. helping the PF avoid bumping into the overhead beam.

_____ 4.1.5.4.2 PF: Remove the top cover from the vapor/liquid separator.

_____ 4.1.5.4.3 PF: Remove the demister pad assembly from the vapor/liquid separator.

_____ 4.1.5.4.4 SS/ELEC: Remove and release DSF-600 lockout/tagout.

NOTE 1: *Other VVETTECHs must support the VVETTECH who performs Step 4.1.5.4.5 as follows:*

A. ensuring stability of the step ladder

B. passing the 1 to 2 gal water container to and from the VVETTECH

C. helping the VVETTECH avoid bumping into the overhead beam.

NOTE 2: *Step 4.1.5.4.5 may be repeated, if and when necessary, to increase the level in the vapor/liquid separator to above a setpoint so that a portion of the level alarm testing can be repeated after a problem is resolved.*

_____ 4.1.5.4.5 VVETTECH: Using a 1 to 2 gal container, pour about 5 gal of DI water into the vapor/liquid separator.

_____ 4.1.5.4.6 VVETTECH: Place the P-101 temporary outlet line so that water will be pumped back into the vapor/liquid separator.

_____ 4.1.5.4.7 VVETTECH: Open hand isolation valves HIV-102, HIV-113, and HIV-115.

_____ 4.1.5.4.8 VVETTECH: Place HS-802 in the HAND position and ensure the SCADA screen position indication matches the position of HS-802 located on panel PP-600.

_____ 4.1.5.4.9 VVETTECH: Ensure pump P-101 starts.

_____ 4.1.5.4.10 VVETTECH: Ensure LMP-806 is flashing on PP-600 and flashing yellow on the SCADA screen.

_____ 4.1.5.4.11 VVETTECH: Ensure LMP-802 is illuminated on PP-600 and on the SCADA screen.

_____ 4.1.5.4.12 VVETTECH: View the process screen on the SCADA.

_____ 4.1.5.4.13 VVETTECH: Ensure when V/L separator drain pump is on, the P-101 pump is green on the SCADA screen.

_____ 4.1.5.4.14 VVETTECH: View the Unit D status screen on the SCADA.

_____ 4.1.5.4.15 VVETTECH: Ensure when P-101 is running, the P-101 status block on the SCADA indicates "P-101 ON" in green in the first display and "CURRENT OKAY" in green in the second display.

_____ 4.1.5.4.16 VVETTECH: Place HS-802 in the OFF position.

_____ 4.1.5.4.17 VVETTECH: Ensure when P-101 is not running, the P-101 status block on the SCADA indicates "P-101 OFF" in red in the first display and "CURRENT OKAY" in green in the second display.

_____ 4.1.5.4.18 VVETTECH: View the process screen on the SCADA.

_____ 4.1.5.4.19 VVETTECH: Ensure when V/L separator drain pump is off, the P-101 pump is red on the SCADA screen.

_____ 4.1.5.4.20 VVETTECH: View the control panel screen on the SCADA.

_____ 4.1.5.4.21 VVETTECH: Ensure the SCADA screen position indication matches the position of HS-802 located on panel PP-600.

_____ 4.1.5.4.22 VVETTECH: Ensure LMP-806 is not flashing on PP-600 or flashing yellow on the SCADA screen.

_____ 4.1.5.4.23 VVETTECH: Return HS-802 to the AUTO position.

_____ 4.1.5.4.24 VVETTECH: Ensure the SCADA screen position indication matches the position of HS-802 located on panel PP-600.

_____ 4.1.5.4.25 VVETTECH: Ensure LMP-802 is NOT illuminated on PP-600 and on the SCADA screen.

_____ 4.1.5.4.26 VVETTECH: Place the P-101 temporary outlet line into a water bottle.

_____ 4.1.5.4.27 VVETTECH: Place HS-802 in the HAND position to pump water from the vapor/liquid separator to the water bottle.

CAUTION

If pump P-101 is run dry, rotating parts may seize and the seal maybe damaged.

_____ 4.1.5.4.28 VVETTECH: WHEN the water level in the vapor/liquid separator decreases below the bottom view port,
THEN place HS-802 in the OFF position to stop P-101.

_____ 4.1.5.4.29 VVETTECH: Close HIV-102 and HIV-115.

4.1.5.5 HS-803, V-101 Well Isolation Valve

_____ 4.1.5.5.1 VVETTECH: Place HS-803 in the OPEN position and ensure the SCADA screen position indication matches the position of HS-803 located on panel PP-600.

_____ 4.1.5.5.2 VVETTECH: Ensure the vadose isolation valve V-101 opens.

_____ 4.1.5.5.3 VVETTECH: Ensure LMP-806 is flashing on PP-600 and flashing yellow on the SCADA screen.

_____ 4.1.5.5.4 VVETTECH: Ensure LMP-804 is illuminated on PP-600 and on the SCADA screen.

_____ 4.1.5.5.5 VVETTECH: Ensure LMP-805 is not illuminated on PP-600 or on the SCADA screen.

_____ 4.1.5.5.6 VVETTECH: View the well status screen on the SCADA.

_____ 4.1.5.5.7 VVETTECH: Ensure when V-101 is open, the V-101 valve is green on the SCADA.

_____ 4.1.5.5.8 VVETTECH: Place HS-803 in the OFF position.

_____ 4.1.5.5.9 VVETTECH: Ensure V-101 closes.

_____ 4.1.5.5.10 VVETTECH: Ensure when V-101 is closed, the V-101 valve is red on the SCADA.

_____ 4.1.5.5.11 VVETTECH: View the control panel screen on the SCADA.

_____ 4.1.5.5.12 VVETTECH: Ensure the SCADA screen position indication matches the position of HS-803 located on panel PP-600.

_____ 4.1.5.5.13 VVETTECH: Ensure LMP-806 is not flashing on PP-600 or flashing yellow on the SCADA screen.

_____ 4.1.5.5.14 VVETTECH: Ensure LMP-805 is illuminated on PP-600 and on the SCADA screen.

_____ 4.1.5.5.15 VVETTECH: Ensure LMP-804 is not illuminated on PP-600 or on the SCADA screen.

_____ 4.1.5.5.16 VVETTECH: Return HS-803 to the AUTO position.

_____ 4.1.5.5.17 VVETTECH: Ensure the SCADA screen position indication matches the position of HS-803 located on panel PP-600.

_____ 4.1.5.5.18 VVETTECH: Ensure LMP-805 is illuminated on PP-600 and on the SCADA screen.

_____ 4.1.5.5.19 VVETTECH: Ensure LMP-804 is not illuminated on PP-600 or on the SCADA screen.

4.1.5.6 HS-804, FCV-107 Auto Dilution Air Valve

_____ 4.1.5.6.1 VVETTECH: Place HS-804 in the CLOSE position and ensure the SCADA screen position indication matches the position of HS-804 located on panel PP-600.

_____ 4.1.5.6.2 VVETTECH: Ensure the automatic dilution air valve FCV-107 fully closes.

_____ 4.1.5.6.3 VVETTECH: Ensure LMP-806 is flashing on PP-600 and flashing yellow on the SCADA screen.

_____ 4.1.5.6.4 VVETTECH: Ensure LMP-807 is illuminated on PP-600 and on the SCADA screen.

_____ 4.1.5.6.5 VVETTECH: Ensure LMP-808 is not illuminated on PP-600 or on the SCADA screen.

_____ 4.1.5.6.6 VVETTECH: View the process screen on the SCADA.

_____ 4.1.5.6.7 VVETTECH: Ensure OIT reads 100% closed and the SCADA reads 0% open for FCV-107.

_____ 4.1.5.6.8 VVETTECH: View the operator interface screen on the SCADA.

_____ 4.1.5.6.9 VVETTECH: Ensure the SCADA reads 100% closed.

_____	4.1.5.6.10	VVETTECH: Place HS-804 in the OFF position.
_____	4.1.5.6.11	VVETTECH: Ensure FCV-107 opens.
_____	4.1.5.6.12	VVETTECH: Ensure the SCADA reads 0% closed.
_____	4.1.5.6.13	VVETTECH: View the process screen on the SCADA.
_____	4.1.5.6.14	VVETTECH: Ensure the OIT reads 0% closed and the SCADA reads 100% open for FCV-107.
_____	4.1.5.6.15	VVETTECH: View the control panel screen on the SCADA.
_____	4.1.5.6.16	VVETTECH: Ensure the SCADA screen position indication matches the position of HS-804 located on panel PP-600.
_____	4.1.5.6.17	VVETTECH: Ensure LMP-806 is not flashing on PP-600 or flashing yellow on the SCADA screen.
_____	4.1.5.6.18	VVETTECH: Ensure LMP-808 is illuminated on PP-600 and on the SCADA screen.
_____	4.1.5.6.19	VVETTECH: Ensure LMP-807 is not illuminated on PP-600 or on the SCADA screen.
_____	4.1.5.6.20	VVETTECH: Return HS-804 to the AUTO position.
_____	4.1.5.6.21	VVETTECH: Ensure the SCADA screen position indication matches the position of HS-804 located on panel PP-600.
_____	4.1.5.6.22	VVETTECH: Ensure LMP-808 is illuminated on PP-600 and on the SCADA screen.

_____ 4.1.5.6.23 VVETTECH: Ensure LMP-807 is not illuminated on PP-600 or on the SCADA screen.

4.1.5.7 HS-805, P-102 Liquid Injection Pump

NOTE: *The stroke length and stroke frequency may be adjusted at any time during completion of this procedure, if directed by the SE.*

_____ 4.1.5.7.1 VVETTECH: Set the P-102 stroke length and stroke frequency to valves specified by the SE and documented in the VVET Unit D Logbook.

_____ 4.1.5.7.2 VVETTECH: Ensure the P-102 inlet line is NOT in a DI water supply bottle.

_____ 4.1.5.7.3 VVETTECH: Place HS-805 in the HAND position and ensure the SCADA screen position indication matches the position of HS-805 located on panel PP-600.

_____ 4.1.5.7.4 VVETTECH: Ensure DI water pump P-102 starts.

_____ 4.1.5.7.5 VVETTECH: Ensure LMP-806 is flashing on PP-600 and flashing yellow on the SCADA screen.

_____ 4.1.5.7.6 VVETTECH: Ensure LMP-809 is illuminated on PP-600 and on the SCADA screen.

_____ 4.1.5.7.7 VVETTECH: View the process screen on the SCADA.

_____ 4.1.5.7.8 VVETTECH: Ensure when P-102 is on, the P-102 pump is green on the SCADA screen.

_____ 4.1.5.7.9 VVETTECH: Place HS-805 in the OFF position.

_____ 4.1.5.7.10 VVETTECH: Ensure when P-102 is off, the P-102 pump is red on the SCADA screen.

_____ 4.1.5.7.11 VVETTECH: View the control panel screen on the SCADA.

_____ 4.1.5.7.12 VVETTECH: Ensure the SCADA screen position indication matches the position of HS-805 located on panel PP-600.

_____ 4.1.5.7.13 VVETTECH: Ensure LMP-806 is not flashing on PP-600 or flashing yellow on the SCADA screen.

_____ 4.1.5.7.14 VVETTECH: Ensure LMP-809 is not illuminated on PP-600 or on the SCADA screen.

_____ 4.1.5.7.15 VVETTECH: Return HS-805 to the AUTO position.

_____ 4.1.5.7.16 VVETTECH: Ensure the SCADA screen position indication matches the position of HS-805 located on panel PP-600.

_____ 4.1.5.7.17 VVETTECH: Ensure LMP-809 is not illuminated on PP-600 or on the SCADA screen.

4.1.5.8 HS-850, Well HTR-150

_____ 4.1.5.8.1 VVETTECH: Place HS-850 in the OFF position.

_____ 4.1.5.8.2 VVETTECH: Ensure the SCADA screen position indication matches the position of HS-850 located on panel PP-600.

_____ 4.1.5.8.3 VVETTECH: Ensure LMP-850 is NOT illuminated on PP-600 or on the SCADA screen.

NOTE: *Heater HTR-150 will not be energized when Step 4.1.5.8.4 is performed because of a control system interlock.*

_____ 4.1.5.8.4 VVETTECH: Place HS-850 in the ON position.

_____ 4.1.5.8.5 VVETTECH: Ensure the SCADA screen position indication matches the position of HS-850 located on panel PP-600.

_____ 4.1.5.8.6 VVETTECH: Ensure LMP-850 is NOT illuminated on PP-600 or on the SCADA screen.

4.1.5.9 Emergency Shut Down (ESD) Button

_____ 4.1.5.9.1 VVETTECH: Push in the ESD button.

_____ 4.1.5.9.2 VVETTECH: Ensure the ESD indicator on the SCADA screen is red when the ESD button is activated on PP-600.

_____ 4.1.5.9.3 VVETTECH: Pull out the ESD button.

_____ 4.1.5.9.4 VVETTECH: Ensure the ESD indicator on the SCADA screen is maroon when the ESD button is not activated on PP-600.

_____ 4.1.6 VVETTECH: Fully open the manual dilution air intake valve FCV-106.

_____ 4.1.7 VVETTECH: Valve in PDT-101, PDI-101, PDT-150, PDI-150, and PI-102.

WARNING

CP-800 contains 120 V conductors that could present an electrocution hazard.

_____ 4.1.7.1 Open the CP-800 door.

_____ 4.1.7.2 IF the transparent cover that prevents contact with exposed conductors is NOT in place, THEN IMMEDIATELY close the CP-800 door.

_____ 4.1.7.3 Fully open hand isolation valves HIV-108, HIV-109, and HIV-110 (located in CP-800).

_____ 4.1.7.4 Close and latch the CP-800 door.

_____ 4.1.7.5 Fully open hand isolation valves HIV-151 and HIV-152.

_____ 4.1.8 VVETTECH: Place HS-802 in the OFF position.

_____ 4.1.9 VVETTECH: Ensure liquid transfer pump isolation valves HIV-102 and HIV-115 are fully closed.

4.1.10 Vapor/Liquid Separator

_____ 4.1.10.1 SS/ELEC: Lockout/tagout Circuit No. 13 of LP-1.

_____ 4.1.10.2 ELEC: Remove the cover from HTR-101 heater cap.

_____ 4.1.10.3 VVETTECH: Adjust HTR-101 thermostat setpoint to a value specified by the SE.

_____ 4.1.10.4 ELEC: Replace the HTR-101 heater cap.

_____ 4.1.10.5 SS/ELEC: Remove/release LP-1 Circuit No. 13 lockout/tagout and place the breaker in the ON position.

_____ 4.1.10.6 VVETTECH: View the process screen on the SCADA.

_____ 4.1.10.7 VVETTECH: Ensure when the water level in the separator is below the bottom view port, the bottom view port on the SCADA for LSL-100 is red and the two other view ports are white.

_____ 4.1.10.8 TE: Ensure heater HTR-101 is OFF.

_____ 4.1.10.9 VVETTECH: Ensure the HTR-101 cap on the SCADA is red.

NOTE: *Other VVETTECHs must support the VVETTECH who performs the steps necessary to add water to the vapor/liquid separator as follows:*

A. ensuring stability of the step ladder

B. passing the 1 to 2 gal water container to and from the VVETTECH

C. helping the VVETTECH avoid bumping into the overhead beam.

_____ 4.1.10.10 VVETTECH: Using a 1 to 2 gal container, begin filling the vapor/liquid separator with DI water.

_____ 4.1.10.11 TE: Ensure that as the liquid level passes the bottom view port, the LSL-100 switch is activated.

_____ 4.1.10.12 VVETTECH: Ensure the bottom view port turns white on the SCADA screen.

_____ 4.1.10.13 TE: Ensure heater HTR-101 is ON.

_____ 4.1.10.14 VVETTECH: Ensure the heater cap on the SCADA screen is green.

_____ 4.1.10.15 TE: Ensure as the liquid level passes the middle view port, the LSH-100 switch is activated.

_____ 4.1.10.16 VVETTECH: Ensure that the middle view port turns red on the SCADA screen.

_____ 4.1.10.17 VVETTECH: Ensure the amber beacon is illuminated.

_____ 4.1.10.18 VVETTECH: View the control panel screen on the SCADA.

_____ 4.1.10.19 VVETTECH: Continue filling the vapor/liquid separator until the water level is above the upper view port.

_____ 4.1.10.20 VVETTECH: Ensure the red shut down indicator on the SCADA screen is flashing, the red shut down beacon is energized, and the amber warning beacon is de-energized.

_____ 4.1.10.21 VVETTECH: View the process screen on the SCADA.

_____ 4.1.10.22 TE: Ensure as the liquid level passes the upper view port, the LSHH-100 switch is activated.

_____ 4.1.10.23 VVETTECH: Ensure the upper view port turns red on the SCADA screen.

_____ 4.1.10.24 VVETTECH: Place the P-101 outlet line into a DI water container.

_____ 4.1.10.25 VVETTECH: Open HIV-115 and HIV-102.

_____ 4.1.10.26 VVETTECH: Place HS-802 in the HAND position to start the transfer pump.

_____ 4.1.10.27 TE: Ensure as the liquid level passes the upper view port, the LSHH-100 switch is deactivated.

_____ 4.1.10.28 VVETTECH: Ensure the upper view port turns white on the SCADA screen.

_____ 4.1.10.29 VVETTECH: Ensure the red shut down beacon is de-energized and the amber beacon is energized.

_____ 4.1.10.30 TE: Ensure as the liquid level passes the middle view port, the LSH-100 switch is deactivated.

_____ 4.1.10.31 VVETTECH: Ensure the middle view port turns white on the SCADA screen.

CAUTION

If pump P-101 is run dry, rotating parts may seize and the seal may be damaged.

_____ 4.1.10.32 VVETTECH: When the liquid level is below the bottom view port, place HS-802 in the OFF position to stop pump P-101.

_____ 4.1.10.33 TE: Ensure HTR-101 is OFF.

_____ 4.1.10.34 SS/ELEC: Lockout/tagout DSF-600.

NOTE: *Other craft personnel or a VVETTECH(s) must support the PF, when performing Steps 4.1.10.35 and 4.1.10.36, as follows:*

A. ensuring stability of the step ladder

B. passing the demister and vapor/liquid separator to the PF on the ladder

C. helping the PF avoid bumping into the overhead beam.

_____ 4.1.10.35 PF: Reinstall the demister pad.

_____ 4.1.10.36 PF: Reinstall the top cover of the vapor/liquid separator.

_____ 4.1.10.37 VVETTECH: Ensure the amber beacon is de-energized.

_____ 4.1.10.38 SS/ELEC: Release DSF-600 lockout/tagout.

_____ 4.1.10.39 SS/ELEC: Lockout/tagout Circuit No. 13 of LP-1.

_____ 4.1.10.40 ELEC: Remove the cover from HTR-101 heater cap.

_____ 4.1.10.41 VVETTECH: Adjust HTR-101 thermostat setpoint to a value specified by the SE.

_____ 4.1.10.42 ELEC: Replace the HTR-101 heater cap cover.

_____ 4.1.10.43 SS/ELEC: Remove/release LP-1 Circuit No. 13 lockout/tagout and place the breaker to the ON position.

4.1.11 Preheater HTR-201

_____ 4.1.11.1 TE: Ensure the system preheater HTR-201 is not energized.

_____ 4.1.11.2 VVETTECH: Ensure the green preheater indicator lamp LMP-803 is not illuminated.

_____ 4.1.11.3 VVETTECH: Ensure the HTR-201 cap is red on the SCADA screen.

_____ 4.1.11.4 VVETTECH: View the Unit D status screen.

_____ 4.1.11.4.1 Ensure "HTR-201 #1 OFF" is displayed in red in the first block and "SCR-603 OK" is displayed in green in the second block of the HTR-210 #1 status block.

_____ 4.1.11.4.2 Ensure "HTR-201 #2 OFF" is displayed in red in the first block and "SCR-604 OK" is displayed in green in the second block of the HTR-210 #2 status block.

_____ 4.1.11.4.3 Ensure "EXIT TEMP OKAY" is displayed in green in the catalyst exit temp block on the SCADA screen.

_____ 4.1.11.4.4 Ensure "HTR-150 OFF" is displayed in red in the first block, "SCR-650 OK" is displayed in green in the second block, and "TS-850 TEMP OK" is displayed in green in the third block of the well heater 150 status block.

_____ 4.1.11.4.5 Ensure "HTR-160 OFF" is displayed in red in the first block, "SCR-660 OK" is displayed in green in the second block, and "TS-860 TEMP OK" is displayed in green in the third block of the well heater 160 status block.

_____ 4.1.11.4.6 Ensure "HTR-170 OFF" is displayed in red in the first block, "SCR-670 OK" is displayed in green in the second block, and "TS-870 TEMP OK" is displayed in green in the third block of the well heater 170 status block.

_____ 4.1.11.4.7 Ensure "HTR-180 OFF" is displayed in red in the first block, "SCR-680 OK" is displayed in green in the second block, and "TS-880 TEMP OK" is displayed in green in the third block of the well heater 180 status block.

_____ 4.1.12 VVETTECH: Ensure FCV-112 is about 50% open.

_____ 4.1.13 VVETTECH: Display FT-101 on the OIT.

WARNING

Operation of the blower without the guard in place is prohibited and could result in personnel injury.

NOTE: *Steps 4.1.16, 4.1.18, and 4.1.25 have a time dependence on Step 4.1.14.*

_____ 4.1.14 VVETTECH: Start Unit D by pressing the START button on the OIT.

NOTE: *Systems heaters will come on and, as discussed during the pre-job briefing, surface temperatures will increase.*

_____ 4.1.15 VVETTECH: Ensure the PLC completes Steps 4.1.15.1 through 4.1.15.4 below:

_____ 4.1.15.1 VVETTECH: Ensure ambient air intake valve FCV-107 automatically opens.

_____ 4.1.15.1.1 Ensure that the red ambient air intake indicator lamp LMP-808 is illuminated.

_____ 4.1.15.1.2 Ensure the green ambient air intake lamp LMP-807 is NOT illuminated.

_____ 4.1.15.2 VVETTECH: Ensure vadose isolation valve V-101 automatically closes.

_____ 4.1.15.2.1 Ensure that the red vadose isolation indicator lamp LMP-805 is illuminated.

_____ 4.1.15.2.2 Ensure that the green vadose isolation indicator LMP-804 is NOT illuminated.

NOTE: *Unless previously completed in association with Step 4.1.5.3.2, an IH must promptly complete a noise survey after the blower is turned on. The IH will establish and post hearing protection requirements, if needed.*

_____ 4.1.15.3 VVETTECH: Ensure the blower motor BLO-101 automatically starts.

_____ 4.1.15.3.1 Ensure that the green blower indicator lamp LMP-801 is illuminated.

_____ 4.1.15.4 VVETTECH: Ensure automatic control of the blower recirculation valve FCV-112 is started.

_____ 4.1.16 VVETTECH: Ensure, using the OIT, that flow FT-101 reaches the specified minimum air flow rate of 200 standard cubic feet per minute (scfm) in the 15 seconds allotted.

WARNING

CP-800 contains 120 V conductors that could present an electrocution hazard.

NOTE: *Steps 4.1.17 and 4.1.18 may be completed concurrently.*

_____ 4.1.17 VVETTECH: Adjust hand isolation valves HIV-108 and HIV-109 to minimize observed pressure fluctuation at differential pressure indicator PDI-101.

_____ 4.1.17.1 Open the CP-800 door.

_____ 4.1.17.2 IF the transparent covers that prevent contact with exposed conductors are NOT in place,
THEN IMMEDIATELY close the CP-800 door.

_____ 4.1.17.3 Ensure when adjusted, neither valve, HIV-108 or HIV-109, is in the fully closed position.

_____ 4.1.17.4 Close and latch the CP-800 door.

_____ 4.1.18 TE: Ensure the system preheater HTR-201 is energized approximately 60-seconds from the time the OIT start key is pressed.

_____ 4.1.18.1 VVETTECH: Ensure the green preheater indicator lamp LMP-803 is illuminated.

_____ 4.1.18.2 VVETTECH: View the process screen on the SCADA.

_____ 4.1.18.2.1 Ensure HTR-201 cap is green on the SCADA screen.

_____ 4.1.18.3 VVETTECH: View the Unit D status screen on the SCADA.

_____ 4.1.18.3.1 Ensure "HTR-201 #1 ON" is displayed in green in the first block and "SCR-603 OK" is displayed in green in the second block of the HTR- 210 #1 status block.

_____ 4.1.18.3.2 Ensure "HTR-201 #2 ON" is displayed in green in the first block and "SCR-604 OK" is displayed in green in the second block of the HTR-210 #2 status block.

_____ 4.1.18.3.3 Ensure "EXIT TEMP OKAY" is displayed in green in the catalyst exit temp block on the SCADA screen.

_____ 4.1.18.3.4 Ensure "HTR-150 OFF" is displayed in red in the first block, "SCR-650 OK" is displayed in green in the second block, and "TS-850 TEMP OK" is displayed in green in the third block of the well heater 150 status block.

_____ 4.1.19 VVETTECH: Open manual well isolation valve V-150 to the full open position.

_____ 4.1.20 VVETTECH: Using the OIT, adjust the TE-301 setpoint to 950°F.

_____ 4.1.21 VVETTECH: Using the OIT, adjust the FT-101 setpoint to 350 scfm.

_____ 4.1.22 VVETTECH: View the temperature screen on the SCADA.

_____ 4.1.22.1 Ensure the TE-101 reading matches the OIT display for the extraction blower discharge temperature TE-101.

_____ 4.1.22.2 Ensure the TE-301 reading matches the OIT display for the catalyst inlet temperature TE-301.

_____ 4.1.22.3 Ensure the TE-302B reading matches the OIT display for catalyst exit temperature TE-302B.

_____ 4.1.22.4 Ensure the TE-303 reading matches the OIT display for system exit temperature TE-303.

_____ 4.1.22.5 Ensure the TE-150A reading matches the OIT display for well head exit temperature TE-150A.

_____ 4.1.22.6 Ensure the TE-151 reading matches the OIT display for well manifold inlet temperature TE-151.

_____ 4.1.23 VVETTECH: View the process screen on the SCADA.

_____ 4.1.23.1 Ensure the TE-101 reading matches the OIT display for the extraction blower discharge temperature TE-101.

_____ 4.1.23.2 Ensure the TE-301 reading matches the OIT display for the catalyst inlet temperature TE-301.

_____ 4.1.23.3 Ensure the TE-302B reading matches the OIT display for catalyst exit temperature TE-302B.

_____ 4.1.23.4 Ensure the TE-303 reading matches the OIT display for system exit temperature TE-303.

_____ 4.1.23.5 Ensure the FT-101 reading matches the OIT display for total system flow FT-101.

_____ 4.1.24 VVETTECH: View the well status screen on the SCADA.

_____ 4.1.24.1 Ensure V-101 is red.

_____ 4.1.24.2 Ensure HTR-150 is red.

NOTE: *Using an infrared temperature measuring device, surface temperature measurements should be taken and documented in the VVET Unit D logbook at the direction of the cognizant HSO. If an accessible surface >125°F is found, it must be promptly labeled or covered. The labeling or covering can be either temporary or permanent for conduct of the remainder of this procedure. A VVETTECH or designee will be assigned to ensure that no one accesses the hot surface until the labeling or covering of the hot surface is completed.*

_____ 4.1.25 VVETTECH: Using the OIT, ensure the temperatures listed below are reached within two hours of startup:

A. reactor inlet temperature (TE-301) = 950°F

B. reactor outlet temperature (TE-302) = 950°F

C. exhaust temperature (TE-303) = 350°F.

_____ 4.1.26 VVETTECH: WHEN desired temperatures and flow are satisfied, THEN ensure the well head isolation valve V-101 is opened and the green vadose isolation indicator lamp LMP-804 is illuminated.

_____ 4.1.26.1 Ensure the red vadose isolation indicator LMP-805 is NOT illuminated.

_____ 4.1.27 VVETTECH: Ensure the ambient air intake valve FCV-107 closes and the green ambient air intake indicator LMP-807 is illuminated.

_____ 4.1.27.1 Ensure that the red ambient air intake lamp LMP-808 is NOT illuminated.

_____ 4.1.28 VVETTECH: Adjust hand isolation valves HIV-151 and HIV-152 to minimize observed pressure fluctuation at differential pressure indicator PDI-150.

_____ 4.1.29 VVETTECH: Ensure neither valve HIV-151 nor HIV-152, when adjusted, is in the fully closed position.

_____ 4.1.30 VVETTECH: Ensure the process flow is within the acceptable range of 300 to 500 scfm as indicated by FT-101 on the OIT.

_____ 4.1.30.1 Adjust the FT-101 setpoint to 300 scfm.

_____ 4.1.30.2 Ensure that the flow rate is stabilized at the setpoint.

_____ 4.1.30.3 Adjust the FT-101 setpoint to 500 scfm.

_____ 4.1.30.4 Ensure that the flow rate is stabilized at the setpoint.

_____ 4.1.31 VVETTECH: Adjust the well line temperature TE-151 setpoint to 125°F at the OIT.

_____ 4.1.32 VVETTECH: Ensure the well line temperature is maintained at the TE-151 setpoint.

_____ 4.1.33 VVETTECH: View the Unit D status screen on the SCADA.

_____ 4.1.33.1 Ensure "HTR-201 #1 ON" is displayed in green in the first block and "SCR-603 OK" is displayed in green in the second block of the HTR-201 #1 status block.

_____ 4.1.33.2 Ensure "HTR-201 #2 ON" is displayed in green in the first block and "SCR-604 OK" is displayed in green in the second block of the HTR-201 #2 status block.

_____ 4.1.33.3 Ensure "HTR-150 ON" is displayed in green in the first block and "SCR-650 OK" is displayed in green in the second block, and "TS-850 TEMP OK" is displayed in green in the third block of the well heater 150 status block.

_____ 4.1.34 VVETTECH: View the well status screen on the SCADA.

_____ 4.1.34.1 Ensure V-101 is green.

_____ 4.1.34.2 Adjust HIV-151 and HIV-152 to minimize the observed pressure fluctuation at differential pressure indicator PDI-151.

_____ 4.1.34.3 Ensure the reading for FT-150 matches the OIT for well 150 vapor flow rate.

_____ 4.1.34.4 Ensure the reading for TE-151 matches the OIT for well 150 manifold inlet temperature.

_____ 4.1.34.5 Ensure the reading for TE-150 matches the OIT for well heater 150 exit temperature.

_____ 4.1.34.6 Ensure HTR-150 is green.

_____ 4.1.35 VVETTECH: View the operator interface screen on the SCADA.

NOTE: *The following procedure section will assess the functionality of the OIT function of the SCADA. The boxed text indicates buttons to be pressed on the SCADA operator interface screen.*

_____ 4.1.35.1 VVETTECH: Start — Ensure there is a message stating that the start key is inactive on the SCADA.

4.1.35.1.1 Close — Closes the display for the start key.

_____ 4.1.35.2 VVETTECH: Stop — Ensure there is a message stating that the stop key is inactive on the SCADA.

4.1.35.2.1 Close — Closes the display for the stop key.

_____ 4.1.35.3 VVETTECH: System Setpoints — Ensure the catalyst inlet temperature setpoint is displayed. The TE-301 setpoint reading should match the OIT display for the catalyst inlet temperature setpoint TE-301.

_____ 4.1.35.3.1 Next — Ensure the catalyst exit temperature setpoint is displayed. The TE-302A setpoint reading should match the OIT display for the catalyst exit temperature setpoint TE-302A.

_____ 4.1.35.3.2 Next — Ensure the total system process flow rate setpoint is displayed. The PDT-101 setpoint reading should match the OIT display for the total system process flow rate setpoint.

_____ 4.1.35.3.3 Close — Closes the display for the system setpoints.

_____ 4.1.35.4 VVETTECH: System Temp Display — Ensure the extraction blower discharge temperature is displayed. The TE-101 reading should match the OIT display for the extraction blower discharge temperature TE-101.

_____ 4.1.35.4.1 Next — Ensure the catalyst inlet temperature is displayed. The TE-301 reading should match the OIT display for the catalyst inlet temperature TE-301.

_____ 4.1.35.4.2 Next — Ensure the catalyst exit temperature is displayed. The TE-302A reading should match the OIT display for the catalyst exit temperature TE-302A.

_____ 4.1.35.4.3 Next — Ensure the system exit temperature is displayed. The TE-303 reading should match the OIT display for the system exit temperature TE-303.

_____ 4.1.35.4.4 Close — Closes the display for the system temp display.

_____ 4.1.35.5 VVETTECH: System Flow Rates — Ensure that total system vapor flow rate is displayed. The FT-101 reading should match the OIT display for the total system vapor flow rate.

_____ 4.1.35.5.1 Close — Closes the display for the system flow rates.

_____ 4.1.35.6 VVETTECH: System Valve Position — Ensure the automatic dilution air valve FCV-107 % closed reading matches the OIT display for the automatic dilution air valve FCV-107 % closed.

_____ 4.1.35.6.1 Next — Ensure the flow recirculation valve FCV-112 % closed reading concurs with the OIT display for the flow recirculation valve FCV-112 % closed.

_____ 4.1.35.6.2 Close — Closes the display for the system valve position.

_____ 4.1.35.7 VVETTECH: Well Setpoints — Ensure the well 150 manifold inlet temperature TE-151 setpoint value is displayed. The reading should match the OIT display for the well 150 manifold inlet temperature setpoint TE-151.

_____ 4.1.35.7.1 Next — Ensure the well 160 manifold inlet temperature TE-161 setpoint value is displayed. The reading should match the OIT display for the well 160 manifold inlet temperature setpoint TE-161.

_____ 4.1.35.7.2 Next — Ensure the well 170 manifold inlet temperature TE-171 setpoint value is displayed. The reading should match the OIT display for the well 170 manifold inlet temperature setpoint TE-171.

_____ 4.1.35.7.3 Next — Ensure the well 180 manifold inlet temperature TE-181 setpoint value is displayed. The reading should match the OIT display for the well 180 manifold inlet temperature setpoint TE-181.

_____ 4.1.35.7.4 Close — Closes the display for the well setpoints.

_____ 4.1.35.8 VVETTECH: Well Temp Display — Displays the well heater 150 exit temperature TE-150A. The reading should match the OIT display for the well heater 150 exit temperature.

_____ 4.1.35.8.1 Next — Displays the well 150 manifold inlet temperature TE-151. The reading should match the OIT display for the well 150 manifold inlet temperature TE-151.

_____ 4.1.35.8.2 Next — Displays the well heater 160 exit temperature TE-160A. The reading should match the OIT display for the well heater 160 exit temperature.

_____ 4.1.35.8.3 Next — Displays the well 160 manifold inlet temperature TE-161. The reading should match the OIT display for the well 160 manifold inlet temperature TE-161.

_____ 4.1.35.8.4 Next — Displays the well heater 170 exit temperature TE-170A. The reading should match the OIT display for the well heater 170 exit temperature.

_____ 4.1.35.8.5 Next — Displays the well 170 manifold inlet temperature TE-171. The reading should match the OIT display for the well 170 manifold inlet temperature TE-171.

_____ 4.1.35.8.6 Next — Displays the well heater 180 exit temperature TE-180A. The reading should match the OIT display for the well heater 180 exit temperature.

_____ 4.1.35.8.7 Next — Displays the well 180 manifold inlet temperature TE-181. The reading should match the OIT display for the well 180 manifold inlet temperature TE-181.

_____ 4.1.35.8.8 Close — Closes the display for the system temp display.

_____ 4.1.35.9 VVETTECH: Well Flow Rates — Displays the well 150 vapor flow rate FT-150. The reading should match the OIT display for the well 150 vapor flow rate FT-150.

_____ 4.1.35.9.1 Next — Displays the well 160 vapor flow rate FT-160. The reading should match the OIT display for the well 160 vapor flow rate FT-160.

_____ 4.1.35.9.2 Next — Displays the well 170 vapor flow rate FT-170. The reading should match the OIT display for the well 170 vapor flow rate FT-170.

_____ 4.1.35.9.3 Next — Displays the well 180 vapor flow rate FT-180. The reading should match the OIT display for the well 180 vapor flow rate FT-180.

_____ 4.1.35.9.4 Close — Closes the display for the well flow rate.

_____ 4.1.35.10 VVETTECH: Spare — Inactive key.

4.1.35.10.1 Close — Closes the display for the spare.

_____ 4.1.35.11 VVETTECH: Alarm Reset — Ensure there is a message stating that the alarm reset key is inactive on the SCADA.

4.1.35.11.1 Close — Closes the display for the alarm reset.

_____ 4.1.35.12 VVETTECH: Lamp Test — Ensure there is a message stating that the lamp test key is inactive on the SCADA.

_____ 4.1.32.12.1 Close — Closes the display for the lamp test.

NOTE: *Steps 4.1.36.2 and 4.1.36.4 have a time dependence on Step 4.1.36.*

_____ 4.1.36 VVETTECH: Ensure when Unit D is processing and the STOP button on the OIT is pressed, Steps 4.1.36.1 through 4.1.36.5 are performed by the PLC:

_____ 4.1.36.1 Ensure the ambient air intake valve FCV-107 opens and the red ambient air intake indicator lamp LMP-808 is illuminated.

_____ 4.1.36.1.1 Ensure that the green ambient air intake lamp LMP-807 is NOT illuminated.

_____ 4.1.36.2 Ensure the vadose isolation valve V-101 closes ten seconds after the STOP button is pressed.

_____ 4.1.36.3 Ensure the red vadose isolation indicator LMP-805 is illuminated and the green vadose isolation indicator LMP-804 is NOT illuminated.

_____ 4.1.36.4 Ensure the blower BLO-101 and blower indicator lamp LMP-801 are de-energized after a 2-minute post purge.

_____ 4.1.36.5 Ensure the preheater HTR-201 and preheater indicator lamp LMP-803 are de-energized.

_____ 4.1.36.6 Ensure LMP-850 is de-energized, indicating HTR-150 is de-energized.

_____ 4.1.36.7 Restart Unit D by pressing the START button on the OIT.

4.2 System Alarm Checks

_____ 4.2.1 VVETTECH: Ensure when there is a high temperature alarm condition on any of the monitored parameters, Unit D enters instant shut down mode.

WARNING

PP-600 contains 120 V and 480 V conductors that could present an electrocution hazard.

NOTE: *Instant shut down mode produces the following results: one, the auto dilution air valve FCV-107 open; two, the blower BLO-101 de-energizes immediately; and three system heater HTR-201 de-energizes.*

_____ 4.2.1.1 VVETTECH: Open the PP-600 doors.

_____ 4.2.1.2 VVETTECH: IF the transparent covers that prevent contact with exposed conductors are NOT in place, THEN IMMEDIATELY close the PP-600 doors.

_____ 4.2.1.3 VVETTECH: With Unit D operating and using the tool provided, adjust TS-801 until its setpoint temperature is below the outlet temperature of the catalyst bed as indicated by TE-302.

_____ 4.2.1.3.1 Ensure Unit D enters instant shut down mode.

_____ 4.2.1.4 VVETTECH: View the Unit D status screen on the SCADA.

_____ 4.2.1.4.1 Ensure when TS-801 is tripped, "HIGH EXIT TEMP" is displayed in red in the catalyst exit temp status box on the SCADA screen.

_____ 4.2.1.5 VVETTECH: Using the tool provided, reset TS-801 to 1,050°F.

_____ 4.2.1.6 VVETTECH: Restart Unit D by pressing the START button on the OIT.

_____ 4.2.1.7 VVETTECH: With Unit D in run mode and using the tool provided, adjust TS-850 until its setpoint temperature is below the outlet temperature of the wellhead heater as indicated by TE-150.

_____ 4.2.1.8 VVETTECH: Ensure Unit D shuts down and view the Unit D status screen on the SCADA.

_____ 4.2.1.8.1 Ensure when TS-850 is tripped, "TS-850 HI TEMP" is displayed in red in the well heater 150 status box on the SCADA screen.

_____ 4.2.1.9 VVETTECH: Using the tool provided, reset TS-850 to 200°F and restart Unit D by pressing the START button on the OIT.

_____ 4.2.2 VVETTECH: Ensure when there is a thermocouple signal loss, Unit D enters time-delayed shut down mode.

NOTE: *Time delayed shut down mode produces the same actions as pressing the STOP button: one, the auto dilution air valve FCV-107 opens; two, V-101 closes; three, the system heater HTR-201 de-energizes; and four, the blower BLO-101 de-energizes after a 2-minute purge.*

_____ 4.2.2.1 IT: While in preheat or run mode, disconnect either lead from thermocouple TE-101.

_____ 4.2.2.2 VVETTECH: Ensure Unit D completes a time-delayed shut down.

_____ 4.2.2.3 IT: After shut down, reconnect the lead.

_____ 4.2.2.4 VVETTECH: Restart Unit D by pressing the START button on the OIT.

_____ 4.2.3 VVETTECH: Ensure when there is loss of signal from the system vapor flow rate transmitter PDT-101, Unit D enters time delayed shut down mode.

_____ 4.2.3.1 IT: While in preheat or run mode, disconnect a signal lead from the flow transmitter.

_____ 4.2.3.2 VVETTECH: Ensure Unit D completes a time-delayed shut down.

_____ 4.2.3.3 IT: After shut down, reconnect the lead.

_____ 4.2.3.4 VVETTECH: Restart Unit D by pressing the START button on the OIT.

_____ 4.2.4 VVETTECH: Push the ESD button and ensure Unit D completes an instant shut down.

4.3 Additional Testing

NOTE 1: *Section 4.3 will be completed only if requested by the SE or HSO.*

NOTE 2: *Sections 4.3 and 4.4 may be performed concurrently.*

_____ 4.3.1 VVETTECH: Adjust the well line temperature TE-151 setpoint, as directed by the SE.

NOTE: *Step 4.3.2 is performed by a laser safety (TRN-163) trained person.*

_____ 4.3.2 Using an infrared temperature measuring device, take additional surface temperature measurements at the direction of the cognizant HSO and SE. Document the temperature readings in the VVET Unit D logbook.

4.4 Sampling Protocol Verification

_____ 4.4.1 VVETTECH: Don leather gloves.

WARNING

The sample port and sample bag will be hot and could cause burns.

NOTE: *The VVETTECH must ensure that no one without proper PPE contacts the hot sampling lines/sample bag.*

_____ 4.4.2 VVETTECH: Remove the sample port protective cover.

_____ 4.4.3 VVETTECH: Attach the sample bag to the sample port.

NOTE: *Steps 4.4.4 through 4.4.6 are performed concurrently.*

_____ 4.4.4 VVETTECH: Open the sample bag valve.

_____ 4.4.5 VVETTECH: Open valve V-111, fill the sample bag, and close valve V-111.

_____ 4.4.6 VVETTECH: Close the sample bag valve.

NOTE: *Step 4.4.7 is performed by a laser safety (TRN-163) trained person.*

_____ 4.4.7 Using an infrared temperature measuring device, take surface temperature measurements of the sample port and sample bag.

_____ 4.4.8 VVETTECH: WHEN the sample bag has cooled to <125°F, THEN remove the sample bag.

_____ 4.4.9 VVETTECH: IF the sample bag will not cool to <125°F in a timely manner while attached to the sample port, THEN remove the bag from the sample port and keep the bag away from personnel until it cools.

_____ 4.4.10 VVETTECH: Vent the sample bag.

_____ 4.4.11 VVETTECH: IF directed by the SE or HSO, THEN repeat Steps 4.4.2 through 4.4.10.

NOTE: *Leather gloves are no longer required after Step 4.4.12 is complete.*

_____ 4.4.12 VVETTECH: Replace the sample port protective cover.

_____ 4.4.13 VVETTECH: Shut down Unit D by pressing the STOP button on the OIT.

5. RECORDS

Record Description	Classification	Uniform File Code	Disposition Authority	Retention Period
Technical Procedure (TPR)-1764 Case File	Permanent Quality	0276	A16-1.1	Cutoff at the end of each fiscal year. Offer to NARA after 25 years.
INEEL Form 434.14, Pre-job Briefing Checklist	Nonpermanent Quality	7301	TBD	Contact RWMC Records Management for additional information.
INEEL Form 434.15, Pre-job Briefing Attendance Record	Nonpermanent Quality	7301	TBD	Contact RWMC Records Management for additional information.
INEEL Form 433.24, Post-job Review Checklist	Nonpermanent Quality	7301	TBD	Contact RWMC Records Management for additional information.
VVET Logs[a]	Nonpermanent Quality EPI	7305	ENV1-e-6	Destroy when 75 years old.

a. VVET operations include the maintenance of a separate set of logs for each operating unit. Each set includes two log sheets to be completed daily, described as follows:

- Operating Log - serves as a record for the operator's periodic observation and entry of instrument readouts and equipment operating parameters during their shift inspections.
- Narrative Sheet - used to generate a history of conditions, events, problems, accomplishments, etc. for each unit.

6. REFERENCES

Companywide Manual 9, Conduct of Operations

Final Remedial Design/Remedial Action Workplan, Organic Contamination in the Vadose Zone, Operable Unit 7-08 (by Scientech Inc., SCI-COM-200-95, Oct. 1995)

INEL-96/0119, Health and Safety Plan for the Vapor Vacuum Extraction with Treatment for the Organic Contamination in the Vadose Zone at the Radioactive Waste Management Complex, Operable Unit 7-08.

Management Control Procedure (MCP)-2973, Operations Organization and Administration

MCP-2974, Shift Routines and Operating Practices

MCP-2975, Control Area Activities

MCP-2980, Logkeeping

MCP-3450, Developing and Using Job Safety Analyses

MCP-3562, Hazard Identification, Analysis, and Control of Operational Activities

Piping and Instrumentation Drawings 515667, 515641, and 515642

Standard (STD)-101, Integrated Work Control Process

7. APPENDICES

NOTE: *Acronyms and definitions are referenced in the front of this manual.*

Appendix A, Procedure Basis

APPENDIX A

Procedure Basis

Step	Basis	Reference
General	Work processes shall be accomplished using approved procedures, drawings, instructions, work packages or other appropriate means commensurate with the complexity and importance of work.	PRD-101 7.2.1.2
All	Safe work	JSA RWMC-6613

VVET Catalytic Oxidizer Logbook

INEEL VVET Narrative Log – Unit D (500 SCFM)

Date:_____ **Shift Hours:**_____

OU# 7-08 RWMC/OCVZ – Vapor Vacuum Extraction

Activities: (Total Manpower = _____)

Operator Names:

_____

_____

Observations:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Problems/Issues/Accidents:

_____

_____

Inspections/Visitors:

_____

_____

Individual Completing Log: _____

Individual Reviewing Log: _____

VVET Narrative Log – Unit D (500 SCFM) – Continuation Sheet

Individual Completing Log: _____

Individual Reviewing Log: _____

VVET Operating Log – Unit D (500 scfm)

Date:_____ **Shift Hours:**_____

Time	Mode	Analog Gauges							Readings from Operator Interface Terminal								
		PI-150	TI-150	PDI-150	PI-101	PDI-101	PI-102	TI-101	FCV-112 Position	TE-150	TE-151	FE-150	FE-101	TE-101	TE-301	TE-302	TE-303
		IWC	°F	IWC	IWC	IWC	IWC	°F	% Closed	°F	°F	scfm	scfm	°F	°F	°F	°F
Normal Operating Ranges During RUN Mode		80-100	55-150	7-10	70-150	7-10	0-50	55-250	0-100	55-200	55-200	100-550	300-550	55-225	850-1050	850-1050	325-450

	Initial		Initial	Time
Panel Light Check:		Daily Influent Sample Collected		

Operator Notes: _____

_____

_____

_____

_____

_____Individual Completing Log (signature):

_____

Individual Reviewing Log (signature): _____

VVET Catalytic Oxidizer

Daily Roundsheet

RS-045

INEEL

412.09
(02/16/2000 - Rev. 05)

RWMC Round Sheet Radioactive Waste Management Complex	DAILY VVET CATALYTIC OXIDIZER MECHANICAL INSPECTION	Identifier: RS-045 Revision: 0 Page: 1 of 2
Document Control Center: (208) 526-2728	Document Approver: NFM	Effective Date: 07/17/01

DRIVER: CERCLA

Change Number: 32491
JSA Number(s): RWMC-276, -6572

Document Opened: _____ Date: _____
Shift Supervisor (SS)

1. PRECAUTIONS AND LIMITATIONS

1.1 Entry into the Organic Contamination in the Vadose Zone (OCVZ) are on the Subsurface Disposal Area (SDA) requires one-time training to Idaho National Engineering Laboratory (INEL)-96/0119, OCVZ Health and Safety Plan.

1.2 Hard hats, safety glasses with side shields, and safety-toed boots above the ankle are required while working in the SDA.

1.3 Any out of specification reading or conditions must be reported to the SS and System Engineer.

1.4 Any observed leaks or spills of petroleum products must be reported to the Facility Environmental Engineer and SS.

2. INSTRUCTIONS

2.1 Record comments or deficiencies in the narrative section and inform the SS.

2.2 Complete the checks identified in Table 1 for Vapor Vacuum Extraction and Treatment (VVET) Unit D.

Table 1. Equipment parameter/conditions.

Location/System	Min	Normal	Max	As Found
VVET UNIT D Ambient Air Intake				
FCV-106	N/A	Fully Shut	N/A	
VVET UNIT D V/L Separator				
Bottom View Port	N/A	No visible liquid	Visible liquid	
Middle View Port	N/A	No visible liquid	N/A	
Top View Port	N/A	No visible liquid	N/A	
Fluid Leaks	N/A	No leaks	N/A	
VVET UNIT D VVED-BLO-101				
Belt tension (visual check only)	N/A	No excessive play	N/A	
Belt Guard	N/A	In place	N/A	

RWMC Round Sheet Radioactive Waste Management Complex	**DAILY VVET CATALYTIC OXIDIZER MECHANICAL INSPECTION**	Identifier: RS-045 Revision: 0 Page: 2 of 2

Location/System	Min	Normal	Max	As Found
Unusual Noise or Vibration	N/A	None	N/A	
Oil Leaks	N/A	No leaks	N/A	
VVET UNIT D Control Panel				
HS-802	N/A	OFF	N/A	
HS-805	N/A	OFF	N/A	
LMP-806	N/A	Not flashing	N/A	
Bulb Check	N/A	All bulbs illuminate*	N/A	
VVET UNIT D Run Mode Fume/ Ambient Air Sample Flow Rate (scfh)**				
VVED-FI-101	1.9	2.1	2.3	

* LMP-860, LMP-870, and LMP-880 are not required for normal operation.

** The performer shall notify the RCT foreman if Unit D is in run mode and the flow rate is not within the stated range as found.

Narrative Section: List any discrepancies individually and corrective actions taken:

_____

_____

_____

_____

_____

Time Started: _____ Time Completed: _____

Performer: _____ Date: _____
Signature and Title
(MCP-1762, Appendix C, Item P25)

Reviewer: _____ Date: _____
Signature

Document Closed: _____ Date: _____
SS

LST-18
Revision: 8,
04/17/01

Conduct of Operations

Conformance Matrices

(DOE Order 5480.19)

T. D. Cline

Published April 2001

Idaho National Engineering and Environmental Laboratory
Department
Bechtel BWXT Idaho, LLC
Idaho Falls, Idaho 83415

FOREWORD

The following document is the Radioactive Waste Management Complex (RWMC) Conduct of Operations Conformance Matrix. This matrix is used to document the applicability of each Department of Energy (DOE) 5480.19 chapter to the Site Operations and Environmental Restoration Directorate's operations and to document the status of the implementation of the Operations manual and supporting supplemental procedures, if applicable. This matrix combines the applicability of RWMC, OU-7 10 Staged Interim Action Project (Stage 1) and OU-7 13/14 Probing and Coring Activities at RWMC in accordance with IAG-13, Interface Agreement Between RWMC and Operating Unit 7-10 Staged Interim Action Project, Stage 1 and Operable Unit 7-13/14 Remedial Investigation Project, and OU 7-08 Organic Contamination in the Vadose Zone (OCVZ) and OU 7-13/14 (Well Drilling Operations) at RWMC in accordance with IAG-19, Interface Agreement Between RWMC and the WAG 7 Operable Units 7-13/14 and 7-08 Project.

CONTENTS

REVISION

Revision 0: Original dated April 30, 1996, Document ID LST-18 was not assigned at Rev. 0 and is implied to LST-18.

Revision 1: June 5, 1997, clerical revision to change the listed Program Requirements Documents (PRDs) to new Management Control Procedures (MCPs). No technical data changed. The following PRDs have been changed to MCPs as listed:

PRD-140 to MCP-2973, PRD-141 to MCP-2974, PRD-142 to MCP-2975

PRD-143 to MCP-2976, PRD-144 to MCP-2977, PRD-145 to MCP-2978

PRD-146 to MCP-2979, PRD-147 to MCP-2980, PRD-148 to MCP-2981

PRD-149 to MCP-2982, PRD-150 to MCP-2983, PRD-151 to MCP-2984

PRD-152 to MCP-2985, PRD-153 to MCP-2986, PRD-154 to MCP-2987

Also, assign document Identifier "LST-18" to make official LMITCO controlled document.

Revision 2: Added RWMC Supplemental MCP-3167 to LMITCO, MCP-2978 on page 9 and changed applicability for Operation/Maintenance/Technical from "Yes" to "Partial".

Revision 3: Referenced LST-72, Rev 2 to be used in conjunction with this LST-18 concerning Stage I operations at Pit 9. Referenced Interface Agreement, IAG-13, which describes Stage I activities at Pit 9.

Revision 4: Change LST-72, Rev 2 to LST-72, Rev 3, throughout document to be compatible with newly revised LST-72.

Revision 5: Deleted some MCP References and inserted new MCP References.

Revision 6: Deleted "LMITCO" from title and changed Contractor's name to Bechtel BWXT Idaho, LLC. Deleted some MCP references and inserted new MCP and PRD references. Combined "Chapter VI and Chapter VII, Investigation of Abnormal Events" to "Event Investigation and Occurrence Reporting." See side line bars for changed areas. Changed LST-72, Rev. 3, to LST-72, Rev. 5, throughout document to be compatible with newly revised LST-72.

Revision 7: Combined information on LST-72 with LST-18 and deleted LST-72. Added MCP-3251 to page 15, Chapter XIV, Required Reading.

Revision 8: Identify Chapter X, Independent Verification, as being applicable to RWMC as Safety Related Systems are now applicable. Performed only minor editorial changes to other sections of matrix, no other technical changes made.

RWMC CONDUCT OF OPERATIONS CONFORMANCE MATRIX DEFINITIONS

The following definitions describe positions within the Radioactive Waste Management Complex (RWMC) organizations. Following each definition is a list of specific personnel applicable to each position. The RWMC supports positions for Stage I of the OU-7 10 Staged Interim Action Project (SIAP) at Pit 9 and OU-7 13/14 Probing and Coring Project, per IAG-13, Interface Agreement Between RWMC and Operating Unit 7-10 Staged Interim Action Project, Stage I and Operable Unit 7-13/14 Remedial Investigation Project.

Administrative/Office: Administrative/office personnel are responsible for day-to-day support functions that do not directly interface with or impact the operation of a facility. Activities performed by administrative/office personnel are exclusively in an office environment.

RWMC personnel in this category include: administrators, secretaries, janitors, administrative training personnel, and document control personnel. Environmental Restoration (ER) does not maintain administrative personnel at the RWMC.

Environmental Restorations Directorate: ER does not maintain an operations organization at RWMC. ER interfaces with the RWMC Operations Organization through the RWMC ER Point of Contact (POC) and communicates with the RWMC Shift Supervisor (SS) for routine and emergency activities. Specific requirements for compliance to Conduct of Operations are specified in IAG-13, IAG-19, Interface Agreement Between RWMC and the WAG 7 Operable Units 7-13/14 and 7-08 Project, and this Conformance Matrix. Operators are defined as personnel responsible for operating the INEEL Sonic Drill Rig and the Organic Contamination in the Vadose Zone (OCVZ) Vapor Vacuum Extraction Treatment (VVET) units. The Project personnel in this category include: Field Team Leader, drill operator, drill helpers, and OCVZ VVET technicians.

Maintenance/Technicians. Maintenance personnel are responsible for the maintenance and repair of mechanical and electrical equipment. Technicians are responsible for specific maintenance and monitoring activities that include: equipment maintenance, troubleshooting, repair, testing, instrument calibration, inspection, and data surveys.

RWMC personnel in this category include: all maintenance crafts, Life Safety Systems (LSS) technicians, and their line management. (The sonic drill rig is maintained by Central Facilities Area (CFA) fleet mechanics who work under shop orders.)

Operations. Operations is the on-site organization responsible for operating the facility and may include off-site personnel who provide operational support.

Site Operations Directorate. Included in the operating organization are operators, supervisors, and managers. Operators are defined as personnel responsible for performing operations associated with safety systems, operating support systems which could affect safety systems, manipulation of facility controls, monitoring of instrumentation, or conducting activities with radioactive or hazardous materials.

RWMC personnel in this category include: Shift Supervisors, Operations Foremen, Certification Specialists, Stored Waste Examination Pilot Plant (SWEPP) operators, heavy equipment operators, equipment operators, laborers, Radiological Control Technicians (RCTs), and their line management.

Technical Staff. Technical staff is responsible for supervision and performance of technical support functions for operations. Personnel involved in surveillance, testing, analyzing plant data, planning modifications, program review, and technical problem resolution in their area of expertise are also included.

RWMC, ER Sonic Drill Rig, and OCVZ VVET Operations personnel in this category include: design, systems, project, criticality safety, industrial hygiene, industrial safety, construction, radiological, environmental engineers, and engineering support personnel. Also, included in this category are shipping agents, safeguards specialists, Quality Assurance (QA) inspectors, quality engineers, nonnuclear analytical personnel, work control personnel, security personnel, and research and development engineers, scientists, and technicians.

NOTE: *Engineers in the above category periodically operate equipment during testing, programming, or troubleshooting. Personnel performing these activities shall be considered part of the operations organization and shall be responsible to the facility supervisor for implementation of Conduct of Operations under this category.*

CONDUCT OF OPERATIONS CONFORMANCE MATRIX

Directorate: Site Operations and Environmental Restoration

Facility/Facilities: RWMC

Date: March 2001

Chapter and Title	Directorate Applicability Yes/No	Position-Specific Applicability Yes/No/Partial				Procedure Number	Directorate Supplemental and Implementing Procedures
		Operations	Maintenance/ Technician	Technical Staff	Administrative/ Office		
Chapter I Operations Organization and Administration	Yes	Yes	Yes	Yes	Yes	MCP-2973	IAG-13 MCP-1752 MCP-1761 MCP-1791 IAG-19

Deviations/Exemptions: None

Applicability:

Operations:	Fully applicable
Maintenance/Technician:	Fully applicable
Technical Staff:	Fully applicable
Administrative/Office:	Fully applicable

Applies to all RWMC Sonic Drill Rig Operations, and OCVZ Operations personnel

CONDUCT OF OPERATIONS CONFORMANCE MATRIX

Directorate: Site Operations and Environmental Restoration

Facility/Facilities: RWMC

Date: March 2001

Chapter and Title	Directorate Applicability Yes/No	Position-Specific Applicability Yes/No/Partial				Procedure Number	Directorate Supplemental and Implementing Procedures
		Operations	Maintenance/ Technician	Technical Staff	Administrative/ Office		
Chapter II Shift Routines and Operating Practices	Yes	Yes	Yes	No	No	MCP-2974	IAG-13 MCP-1752 MCP-1791 MCP-3228 IAG-19

Deviations/Exemptions: None

Applicability:

Operations: Fully applicable
Maintenance/Technician: Fully applicable
Technical Staff: The technical work group does not operate facility equipment
Administrative/Office: The administrative work groups do not operate facility equipment

CONDUCT OF OPERATIONS CONFORMANCE MATRIX

Directorate: Site Operations and Environmental Restoration

Facility/Facilities: RWMC

Date: March 2001

Chapter and Title	Directorate Applicability Yes/No	Position-Specific Applicability Yes/No/Partial				Procedure Number	Directorate Supplemental and Implementing Procedures
		Operations	Maintenance/ Technician	Technical Staff	Administrative/ Office		
Chapter III Control Area Activities	Yes	Yes	No	No	No	MCP-2975	IAG-13 MCP-1791 MCP-3229 IAG-19

Deviations/Exemptions: None

Applicability:

Operations:	Control Area only for Real-Time Radiography, Drum Vent Facility, Assay Systems, Sonic Drill Rig, Control Trailer, and VVET units.
Maintenance/Technician:	Maintenance/technician staff will not operate equipment
Technical Staff:	Technical staff does not operate in the Control Area
Administrative/Office:	Administrative does not operate in the Control Area

CONDUCT OF OPERATIONS CONFORMANCE MATRIX

Directorate: Site Operations and Environmental Restoration

Facility/Facilities: RWMC

Date: March 2001

Chapter and Title	Directorate Applicability Yes/No	Position-Specific Applicability Yes/No/Partial				Procedure Number	Directorate Supplemental and Implementing Procedures
		Operations	Maintenance/ Technician	Technical Staff	Administrative/ Office		
Chapter IV Operations Communications	Yes	Yes *	Yes	No	No	MCP-2976	IAG-13 MCP-1791 MCP-3230 IAG-19

Deviations/Exemptions: None

Applicability:

Operations:	Fully applicable
Maintenance/Technician:	Fully applicable
Technical Staff:	The technical work group does not operate facility communications equipment
Administrative/Office:	The administrative work groups do not operate facility communications equipment

* For ER: Applies only to sonic drill rig field team leader and drill operator and to OCVZ VVET technicians.

CONDUCT OF OPERATIONS CONFORMANCE MATRIX

Directorate: Site Operations and Environmental Restoration

Facility/Facilities: RWMC

Date: March 2001

Chapter and Title	Directorate Applicability Yes/No	Position-Specific Applicability Yes/No/Partial				Procedure Number	Directorate Supplemental and Implementing Procedures
		Operations	Maintenance/ Technician	Technical Staff	Administrative/ Office		
Chapter V Control of On-Shift Training	Yes	Yes	No	No	No	MCP-2977	IAG-13 PLN-127 MCP-1791 MCP-3231 IAG-19

Deviations/Exemptions: None

Applicability:

Operations: The Operations Department is the only RWMC department that conducts on-shift training. For ER, it is only applicable to the drill operator and VVET operator.

Maintenance/Technician: No applicability

Technical Staff: No applicability

Administrative/Office: No applicability

CONDUCT OF OPERATIONS CONFORMANCE MATRIX

Directorate: Site Operations and Environmental Restoration

Facility/Facilities: RWMC

Date: March 2001

Chapter and Title	Directorate Applicability Yes/No	Position-Specific Applicability Yes/No/Partial				Procedure Number	Directorate Supplemental and Implementing Procedures
		Operations	Maintenance/ Technician	Technical Staff	Administrative/ Office		
Chapters VI and VII Event Investigation and Occurrence Reporting	Yes	Yes *	Yes *	Yes	YeS	MCP-190	 IAG-13 MCP-1791 MCP-1752 MCP-1799 MCP-3233 IAG-19

Deviations/Exemptions: None

Applicability:

Operations:	Fully applicable
Maintenance/Technician:	Fully applicable
Technical Staff:	Technical staff are not typically involved
Administrative/Office:	Administrative/office staff are not typically involved

*For ER: Only Section 4.3 of MCP-190 applies.

CONDUCT OF OPERATIONS CONFORMANCE MATRIX

Directorate: Site Operations and Environmental Restoration

Facility/Facilities: RWMC

Date: March 2001

Chapter and Title	Directorate Applicability Yes/No	Position-Specific Applicability Yes/No/Partial				Procedure Number	Directorate Supplemental and Implementing Procedures
		Operations	Maintenance/ Technician	Technical Staff	Administrative/ Office		
Chapter VIII Control of Equipment and System Status	Yes	Yes	Yes *	No	No	MCP-2978	IAG-13 MCP-1791 MCP-3167 IAG-19

Deviations/Exemptions: RWMC does not use "Caution" tags

Applicability:

Operations:	Yes
Maintenance/Technician:	Yes
Technical Staff:	The technical work groups do not operate facility equipment
Administrative/Office:	The administrative work groups do not operate facility equipment

*For ER: Maintenance does not operate equipment.